WESTERN BIRDS

Vol. 16, No. 1, 1985

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Quarterly Journal of Western Field Ornithologists

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Published August 5, 1985

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Full page	4 x 6¾ inches	$60 per issue	$200 per year
Half Page	4 x 3⅜ inches	$40 per issue	$130 per year
Quarter Page	4 x 1 11/16 inches	$30 per issue	$110 per year

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WESTERN BIRDS

Volume 16, Number 1, 1985

THE BREEDING AVIFAUNA OF SAN BENITO MOUNTAIN, CALIFORNIA: EVIDENCE FOR CHANGE OVER ONE-HALF CENTURY

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The San Benito Mountain region of the southern Diablo Range, San Benito and Fresno counties, California, is of unusual biological interest for several reasons. The highest peaks, San Benito Mountain (5241 ft [1599 m]) and Santa Rita Peak (5165 ft [1575 m]), support on their upper slopes significant forest well isolated from such growth in other areas. The nearest major stands of mixed conifers appear approximately 50 miles (80 km) to the west, in the northern Santa Lucia Range, Monterey County. Eastward, a distance of approximately 93 miles (150 km) separates the San Benito conifers from the rich forests of the Sierra Nevada (Figure 1).

The dominant species of conifer in most of the forest is Coulter Pine (*Pinus coulteri*). It hybridizes extensively with the much scarcer Jeffrey Pine (*Pinus jeffreyi*), the latter species growing in strongly disjunct stands far from its main Sierran distribution (Griffin and Critchfield 1976:82). Digger Pine (*Pinus sabiniana*) and Incense-cedar (*Calocedrus decurrens*) are also prevalent. According to Griffin (1974:13), "the combination of these three related pines all growing together can not be duplicated anywhere else and is of great interest to forest geneticists." Strangely, much of the forest grows in open and highly insolated stands which are largely confined to otherwise bald serpentine soils (Figure 2). A diverse group of shrubby species also forms a conspicuous chaparral element on the serpentine. However, most of these shrubs are not those usually associated with montane forest. In addition, the serpentine soils support an interesting assemblage of herbaceous species, some of which are endemic. The foregoing floristic notes are mainly from Griffin (1974 and 1975). He also fully describes other aspects of the local ecology.

Although the San Benito Mountain area has been easily accessible for years and received concentrated attention from at least two groups of vertebrate zoologists prior to our visits in 1983 and 1984, only scattered bird records from there have been published (Grinnell and Miller 1944). Our survey of *American Birds* for the last decade turned up no recent records for the region. Insofar as we have been able to ascertain, the notes and specimens taken by all previous workers are preserved in the Museum of Vertebrate Zoology, University of California, Berkeley. The first major sample of birds from the region was taken by Fletcher G. Palmer between 9 and 21 June 1936. He was accompanied by David H. Johnson, who mainly collected mammals. Camping at 4400 ft (1342 m), 1 mile (1.61 km) southeast of the San Benito Mountain summit, they collected primarily on the mountain but also visited nearby Santa Rita Peak. Importantly, their work was done during the heart of the breeding season. Eight years later, from 6 to 11 August 1944, Alden H. Miller and Robert W. Storer collected a large number of birds and other vertebrates from much of the highland area surrounding San Benito Mountain as well as from the peak itself. Although their August records are too late to document breeding status for the summer resident species, they are suitable as evidence for the occurrence of permanently resident forms. Our work in 1983 (12-14 May and 8-9 June) and 1984 (12-18 May and 31 May-1 June) focused on the densest stands of conifers on San Benito Mountain, those occurring on north and northeast-facing slopes and draws between 4000 ft and the summit. On 17 May 1984, we censused species found along a 3-mile transect following San Carlos Creek, from 3700 ft (1129 m) to 4400 ft. We also hiked the lower canyon of the East Fork of San Carlos Creek, which differs from much of the area in that it is relatively moist and dominated by Canyon Live Oaks (*Quercus chrysolepis*). Despite the fact that our work emphasized the mid-May period, we stress that nesting behavior and reproductive condition of collected specimens clearly established breeding status for the vast majority of birds present at that time. Surprisingly few birds seem to use San Benito Mountain as a stop-over site during migration. Our studies, as well as those conducted by earlier field parties, are supported by complete and annotated lists of every species encountered in the region. Although we do not consider such compilations to be exhaustive lists, they are complete enough to support the discussion and conclusions on avifaunal change offered beyond.

Coniferous forest in the North Temperate Zone is occupied largely by a boreal avifauna. According to Miller (1951:582-591), such an avifauna in California is comprised of species of fundamentally northern derivation that range into boreal environments of the state, either along the coast or in the highlands. In general, such species are adapted to cool and/or moist habitats. As Miller has mapped (loc. cit.:588), boreal environments along the coast of west-central California are fragmented into two components, Santa Cruz and Monterey; these are positioned north and south of Monterey Bay, respectively. The coniferous forest of San Benito Mountain represents a boreal island lying approximately 50 miles to the east of Miller's Monterey component (hereafter called "the Monterey District"). For one or more reasons, Miller did not include the San Benito Mountain region on his map of the boreal areas of California. First, perhaps he regarded it as one of an

unspecified number of "very small detached boreal areas" which were neither plotted nor analyzed (Miller 1951:583). Second, he may have considered the region to have been incompletely explored avifaunally. Third, he had not personally visited the mountain during the breeding season. In any event, despite the small size, isolation and impoverishment of the boreal environments of the San Benito Mountain region, a substantial mountaintop avifauna occurs there. The first purpose of our paper is to describe this avifauna and to compare it with disjunct boreal avifaunas to the west, namely those of the Monterey District and Hastings Natural History Reservation, and with a more remote boreal avifauna to the east, that of Yosemite National Park in the main Sierra Nevada (Figure 1).

The avifauna of San Benito Mountain deserves special attention for another reason. Because of the thoroughness of the surveys, it is possible to search for evidence of temporal change over the approximate ½ century that elapsed between the early and recent visits. This is the second purpose of our

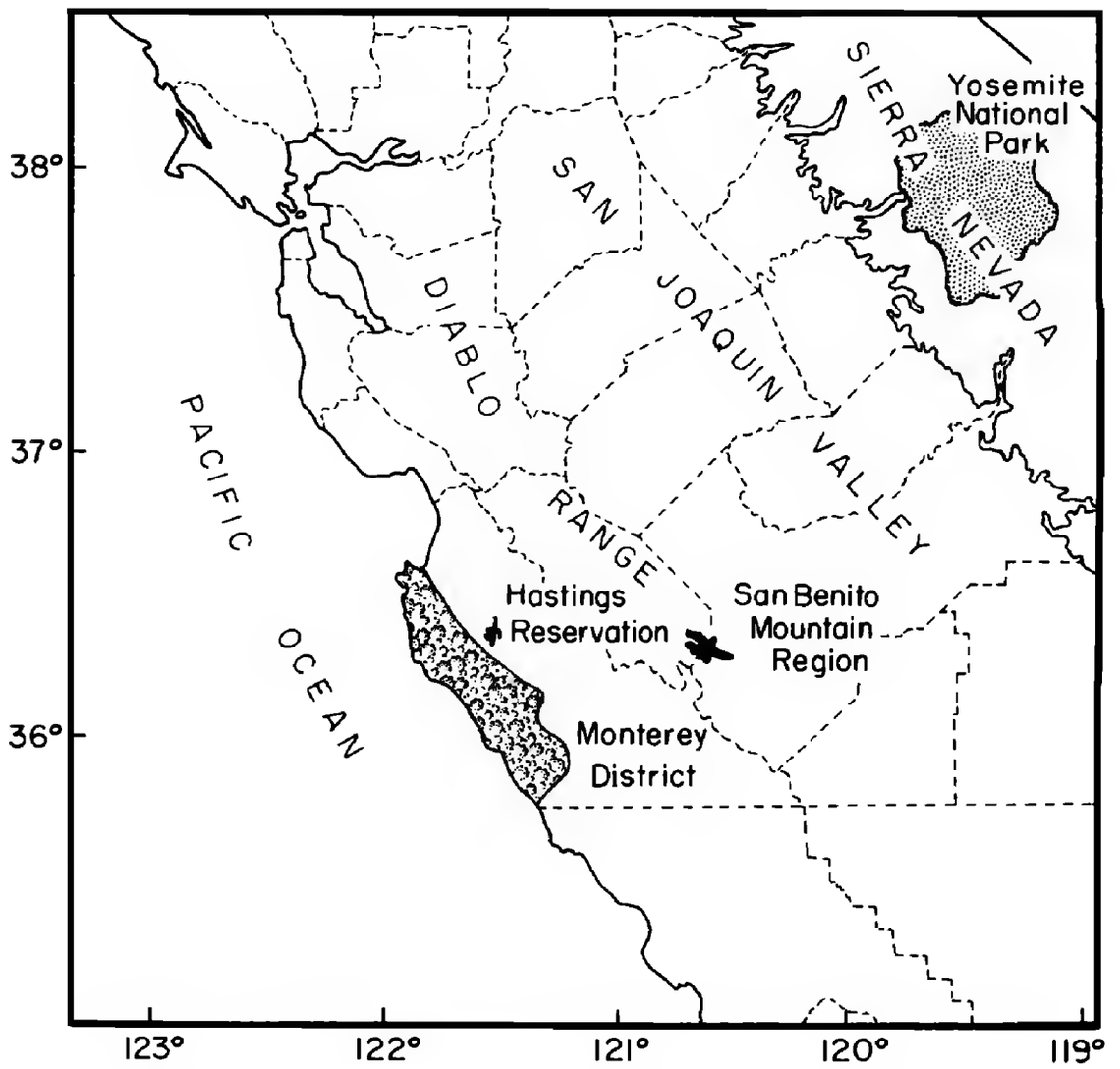

Figure 1. Map of central California showing the location of the San Benito Mountain region in relation to the Monterey District as defined by Miller (1951), the Hastings Natural History Reservation, and Yosemite National Park.

paper. As the following species accounts will show, some surprising changes have indeed occurred, both in the composition of the avifauna and in the abundance of certain breeding species. Although the emphasis of this paper is on boreal species, accounts are also included for austral forms that have either colonized or changed in status within recent decades. Furthermore, we also comment on interesting habitat relationships for particular species.

SPECIES ACCOUNTS

MOUNTAIN QUAIL (*Oreortyx pictus*). Although well-known from the Santa Lucia Range of Monterey Co., this species was not reported from the San Benito Mountain region by Grinnell and Miller (1944:117-119). Thus, Palmer did not record it during his work there in 1936. In contrast, we heard Mountain Quail commonly in 1983, when several widely-spaced individuals were calling on each of several mornings. In May 1984, the species was again recorded but less frequently. Evidently, these individuals were descendants of 43 birds introduced above New Idria in 1957, from stock native to the China Lake region [probably from the nearby Argus Mountains] (*fide* Don Pine of California Department of Fish and Game, J.R. Griffin *in litt.* 10 Jan 1984). There is no evidence that Mountain Quail ever occurred naturally on San Benito Mountain, although the extensive habitat of diverse brushland there seems ideal for this species.

Figure 2. View of the high country, looking north, from the north slope of San Benito Peak, 8 June 1983. Note the open nature of the forest, small stature of the trees, and the prevalence of bare serpentine soil. The track of a dirt bike is visible in the left-center of the foreground.

Photo by Carla Cicero

NORTHERN SAW-WHET OWL (*Aegolius acadicus*). At 0250 on 18 May 1984, we awoke to the rhythmic whistles of this species coming from the forest approximately 400 yards above camp along the East Fork of San Carlos Creek, 4500 ft (1373 m) (at ½ mile north and ½ mile east of San Benito Mountain). The night was clear and cool (Temp. 50°F) with a gibbous moon. In response to our imitations of the call, the owl moved upslope for ½ mile before finally taking a stand in a clump of young Incense-cedars just below the peak. Surrounding this steep site were scattered yellow pines (*P. coulteri* and/or *P. jeffreyi*) and a broken understory of Leather Oak (*Quercus durata*). We approached within 8 ft, and with a dim flashlight watched it call continuously for 8 minutes from the same perch. These calls fluctuated in amplitude, giving the false impression that the owl was changing perches. After departing for approximately 10 minutes, it returned briefly to the same nearby perch and then moved laterally along the slope for several hundred yards. It was not followed further.

In view of the behavior and habitat of this individual, we do not hesitate to include the Northern Saw-whet Owl among the probable breeding species of the region.

HAIRY WOODPECKER (*Dendrocopus villosus hyloscopus*). All ornithologists who have visited the San Benito Mountain region have encountered this woodpecker in the coniferous forest near San Benito Peak. Palmer recorded four to five individuals at 1 mile southeast of San Benito Mountain, 4400 ft. between 9-22 June 1936; during that period, he collected two adult males (testis 4 x 2 mm) and one juvenile male. Miller and Storer also noted several Hairy Woodpeckers at the same locality on 6-12 August 1944. In 1983 and 1984, this species was found regularly in the conifers surrounding the summit. One or two birds were recorded daily, including several pairs, and, on 16 May 1984, a pair was observed in courtship behavior. Therefore, a small breeding population still thrives in the San Benito Mountain region. No change in historical status is indicated.

OLIVE-SIDED FLYCATCHER (*Contopus borealis*). Palmer (MS) stated in June 1936 that he saw Olive-sided Flycatchers "fairly regularly" in the conifers. He took a male in breeding condition (testis 8 x 3 mm) on 10 June. Miller and Storer also reported the species in August 1944, but the individuals at that season could have been early migrants. In 1983 and 1984, this species was surprisingly numerous on San Benito Mountain, with 5-15 males singing on a single day; 14 regularly-spaced singing birds were encountered along our 3-mile transect. One male was taken (testis 11 x 4 mm, no fat) on 13 May 1984 along San Carlos Creek, 4400 ft. These records indicate that the Olive-sided Flycatcher has probably increased in population size between 1936 and 1983-1984.

WESTERN WOOD-PEWEE (*Contopus sordidulus*). This species has definitely increased in numbers on San Benito Mountain in recent decades. Palmer (MS) reported the Western Wood-Pewee as "not common in the conifers" in June 1936. Storer (MS) noted that the species was "seen in the trees around camp and down the stream from camp" between 6-12 August 1944. He took an adult male (testis 3.5 mm; "little" fat) on 10 August at 4400 ft; this individual may have been a locally breeding bird. In contrast, the species was abundant on the mountain in 1983 and 1984. We recorded 6 to 8 individuals on 13 May 1983, approximately 20 territorial males in the conifers during the morning of 9 June 1983, and 34 singing and chasing males along the 17 May 1984 transect. One breeding male (testis 6 x 3.5 mm, no fat) was collected on 16 May 1984 at San Carlos Creek, 4400 ft, and on 1 June an active nest was found in a Coulter Pine near the same creek.

DUSKY FLYCATCHER (*Empidonax oberholseri*). The Dusky Flycatcher had not been recorded as a definite summer resident in the San Benito Mountain region before our visits in 1983 and 1984. Now, a substantial population occupies the mountain, and up to 10 individuals have been found singing on territories in a single day. On 8

June 1983, a singing male in breeding condition (testis 7 x 3 mm, no fat) was taken. Miller and Storer's specimen (testis 2 mm) from the area was not taken until early August (1944), and thus provides equivocal evidence for local nesting. Palmer (MS) did not mention the species.

During our visits, these flycatchers inhabited mixed yellow pines and Incense-cedars with clumps of *Arctostaphylos* and oak brush always nearby. A chaparral or low thicket element seems crucial for nesting wherever the species occurs (Johnson 1963). The nearest probable breeding locality for the Dusky Flycatcher occurs to the west at Chews Ridge, Monterey Co., where singing individuals have been found during late spring and summer in recent years (Chandik and Baldridge 1969; DeSante and LeValley 1971). Prior to these reports, the closest breeding sites included the Mt. Pinos area of Ventura Co. to the south and the higher elevation habitat in the Inner Coast Range of Lake Co. to the north.

GRAY FLYCATCHER (*Empidonax wrightii*). This species is well-known as a summer resident in eastern California. It occurs on the Modoc Plateau, in Mono and Inyo counties (Johnson 1963 and 1966), and throughout the higher mountains of the Mohave Desert (Johnson and Garrett 1974:47, Cardiff and Remsen 1981). Locally, it also breeds on the east slopes of the mountains of southern California (Garrett and Dunn 1981, Weathers 1983). Furthermore, a substantial population occurs in the Chimney Peak area of eastern Tulare Co. (Johnson and Garrett 1974:47). In 1983 and 1984, we found a population of summer resident Gray Flycatchers in the open conifers of San Benito Mountain. One singing male was taken (testis 5 x 3 mm, no fat) on 8 June 1983, ½ mile east of the summit, 4800 ft (1464 m); two others were collected (13 May, 6 x 3 mm; 1 June, 7 x 3 mm) in 1984, 1 mile southeast of the peak, 4400 ft. These birds were patrolling territories in well-spaced Incense-cedars and yellow pines, 2-2.5 ft (0.6-0.8 m) in diameter and 20-25 ft (6-8 m) in height, with a scattered understory of scrub oak and manzanita (Figure 3). Much of the ground was bare, an apparent habitat requirement of this flycatcher (Johnson 1963). Several other individuals were encountered in similar habitat on 9 June 1983, and daily during our work in May 1984. We counted seven birds along our 3-mile transect on 17 May 1984, five of which were males singing repeatedly from small pines and Incense-cedars near the road; the remaining two birds, as well as one seen near Sawmill Creek on 13 May 1984, were probable females that occurred with males nearby and which behaved excitedly at our presence. Importantly, the males were singing in the same areas during our visits in both mid-May and early June 1984. Although no nests were found, the evidence strongly indicates that the flycatchers were established for breeding. This surprising occurrence extends the probable nesting range of the species approximately 150 miles (240 km) westward from the principal breeding distribution on the east side of the Sierra Nevada.

WESTERN FLYCATCHER (*Empidonax difficilis*). Breeding sites for this species are widely scattered in the generally dry Inner Coast Range of central California (Johnson 1980). Palmer took a breeding male (testis 5 x 2.5 mm) of *E. d. difficilis* at 1 mile southeast of the summit of San Benito Mountain, 4400 ft, on 13 June 1936. Miller (MS) reported a family group with short-tailed young in the conifers on 6 August 1944. In 1984, we collected a mated pair of Western Flycatchers (male, testis 5 x 3 mm, no fat; female, ova enlarged, ovary with 2 collapsed follicles, active incubation patch) along the East Fork of San Carlos Creek, 4200 ft. The male was delivering position notes from Canyon Live Oaks and the female was repeatedly uttering alarm notes at our presence, suggesting a nearby nest. The moist, steep-sided canyon of the East Fork, with large oaks shading a small, boulder-studded stream, provided excellent nesting habitat. Such habitats are very local in the region, however, and thus the San Benito population of Western Flycatchers is probably sparse at best. The records indicate no change in historical status.

PURPLE MARTIN (*Progne subis*). Palmer, and Miller and Storer, all recorded this swallow in the San Benito Mountain region. On 21 June 1936, Palmer collected two breeding males (testes 13 x 9 mm and 12 x 8 mm, respectively) 1 mile south of the summit of Santa Rita Peak. Eight years later, on 9 August 1944, at 1 mile southeast of San Benito Peak, Miller and Storer noted that individuals of this species were "overhead frequently." In contrast, we did not record Purple Martins. Therefore, we conclude that the species no longer occurs as a summer resident. Davis et al. (1980) state that the Purple Martin was last recorded at the Hastings Reservation in Monterey Co. on 30 June 1958. Moreover, Arbib (1979) reports the general decline of this species throughout its range in recent years.

VIOLET-GREEN SWALLOW (*Tachycineta thalassina*). This species was fairly numerous on San Benito Mountain in 1983 and 1984. Ten individuals were seen foraging over the forest and near the roads on 8-9 June 1983, and, similarly, several swallows were recorded daily during our work in May 1984; on 17 May, we counted eight individuals along our 3-mile transect. These birds commonly foraged in flocks, often over deep, bare serpentine canyons surrounded by forest near San Benito Peak. Although some of these birds may have been migrants, a few definite pairs were noted. In addition, we found three suspected nests along the road. One was in a crack in a serpentine rock outcropping near the headwaters of the East Fork of San Carlos Creek, 4500 ft (1373 m), and two were in earth banks at 3800 ft (1159 m) and 4500 ft; requisite perches consisting of dead-topped trees or exposed tree roots were always present nearby. A breeding female (ova enlarged to 1 mm) was taken on 14 May 1984 near the first nest, and pairs were seen entering and leaving the other two nest openings. Surprisingly, Palmer did not record the Violet-green Swallow on San

Figure 3. Habitat of a singing male Gray Flycatcher, San Benito Mountain, 8 June 1983 (see species account).

Photo by Carla Cicero

Benito Mountain in 1936; however, he reported small numbers in late June near a creek at 2 miles north-northwest of New Idria, a mining camp located downslope. Miller noted three individuals over Sawmill Creek on 8 August 1944, but these could easily have been migrants. The records indicate a substantial increase in the breeding population of this species in the region within recent decades.

STELLER'S JAY (*Cyanocitta stelleri*). Palmer failed to observe this species in 1936 and it is uncertain whether the Steller's Jay bred on San Benito Mountain at that time. Miller, on the other hand, mentioned (MS) two Steller's Jays calling from a deep, oak-filled canyon on 11 August 1944. He stated that this gulch provided the most favorable habitat for the species in the region, largely because of the lack of "requisite shade" in the open coniferous forest on nearby slopes. Grinnell and Miller (1944:286) also described the need for "cool, wooded canyons or shaded slopes" by interior populations of the Steller's Jay. We found the species to be common during our recent field work. In 1983, two individuals were recorded on 8 June in dense yellow pines and Incense-cedars near the summit of San Benito Peak. Steller's Jays were especially numerous in 1984, when individuals were seen daily in the conifers. A male in breeding condition (testis 9 x 6 mm) was taken along the East Fork of San Carlos Creek, 4200 ft, in a canyon similar to the one which Miller described. We conclude that this jay has increased in abundance on the mountain since 1936.

PLAIN TITMOUSE (*Parus inornatus*). As expected, all surveys have listed the Plain Titmouse for the San Benito Mountain region. In 1936, Palmer (MS) found the species to be "common in the blue oaks," and Grinnell and Miller (1944:308) also reported records for San Benito Mountain, 4400 ft. Grinnell and Miller described the characteristic habitat of the subspecies *P. i. inornatus* as "open-type woodland of which oaks . . . are exclusive or dominant constituents." While such a description seems accurate for much of the range in central California, it conflicts with our observations in 1983 and 1984 for San Benito Mountain. There, all species of arboreal oaks are rare or lacking altogether, especially above 3900 ft (1200 m) (Griffin 1975:20). We saw the species commonly in pines, especially *P. coulteri* and *P. sabiniana*, with lesser use of *P. jeffreyi*. Palmer (MS) also reported titmice in conifers. Of interest here is the possible extent to which the Plain Titmouse is occupying coniferous habitat potentially acceptable to the Mountain Chickadee (*Parus gambeli*), a species not yet known from San Benito Mountain. The closest breeding locality for the Mountain Chickadee is in the Santa Lucia Range, Monterey Co., at 3000 ft (915 m) (Grinnell and Miller 1944:300-302).

PYGMY NUTHATCH (*Sitta pygmaea*). Neither Palmer nor Miller and Storer encountered this species in 1936 and 1944, respectively. In contrast, we found a substantial population of Pygmy Nuthatches in the area. Several birds were present in the pines near our camp on 13 May 1983, and on 8-9 June 1983 we found a number of individuals in the conifers on the east-northeast slope; one pair was seen at a possible nest cavity in a pine snag. Johnson collected a breeding male (testis 5 x 3 mm) of the subspecies *S. p. pygmaea* in an Incense-cedar at approximately ½ mile east of the summit. In May 1984, the species was again encountered fairly commonly; five birds were counted during one morning in the conifers along San Carlos Creek. The discovery of this form on San Benito Mountain represents a definite extension of known range. The nearest previously-known localities for the species, as listed by Norris (1958:121), are 50 miles to the west of San Benito Mountain at Big Pines, 3700 ft (1130 m) (9 miles [15 km] west of Jamesburg), and at 1¼ miles (2 km) south of Chalk Peak, 3000 ft (915 m), both in Monterey Co.

AMERICAN DIPPER (*Cinclus mexicanus*). Although San Benito Mountain has a drier climate than any of the Santa Lucia Range peaks to the west, it has more permanently flowing streams than the latter region (Griffin 1975:7) and, therefore, more potential

habitat for American Dippers. Nonetheless, the species has never been found in the region. Both San Carlos Creek and Sawmill Creek appeared suitable for this species during our visit in 1983, a year of extra-heavy precipitation and runoff. In 1984, on the other hand, the water flow seemed inadequate. Perhaps annual variation in stream volume is too great to permit colonization.

Another factor might also exclude American Dippers from San Benito Mountain. Degradation of water quality by naturally-occurring toxic chemicals could adversely affect aquatic insects upon which dippers forage. Signs in the area currently warn humans that the water is not potable because of chemical contamination. Two biologically-poisonous chemicals, mercury and chromium, have been mined in the region, and an open-pit mine for asbestos is presently active below nearby Santa Rita Peak. Furthermore, the soils derived from serpentine have a serious magnesium-calcium imbalance and are extremely low in total nitrogen and total phosphorus (Griffin 1974:12). Such deficiencies would presumably affect the plants upon which some aquatic insects feed. Although Sawmill and San Carlos creeks contain at least small populations of some aquatic insects, as well as a few frogs, the aquatic resources in general may be insufficient to support breeding dippers.

BLUE-GRAY GNATCATCHER (*Polioptila caerulea*). Palmer in 1936 and Miller and Storer in 1944 all recorded this species as being *the most common bird* in the San Benito Mountain region. Furthermore, Palmer collected two males in breeding condition (11 June, testis 6 x 4 mm; 18 June, testis 6 x 3 mm) during his trip. In contrast, not a single individual was found in 1983 and only two widely-separated pairs were seen in May 1984, although we spent many hours in the same places and habitats where the previous workers had encountered the species abundantly. Thus, we conclude that the Blue-gray Gnatcatcher has dramatically declined on San Benito Mountain, at least at higher elevations where it previously occurred in large numbers.

AMERICAN ROBIN (*Turdus migratorius*). In early June 1983, several American Robins were singing in the yellow pines near moist places along San Carlos and Sawmill creeks. These records are the first for the species from San Benito Mountain. We again recorded several robins in comparable habitats in May-June 1984. Two of these were lone males, one of which was singing vigorously near Sawmill Creek on 12-14 May. The other birds were an interacting pair that responded to imitated Northern Pygmy-Owl (*Glaucidium gnoma*) calls near San Carlos Creek; the male sang continuously for approximately 30 minutes while the female uttered alarm notes, and then the pair departed together. Although there is still no conclusive evidence that the species nests in the area, the records suggest that a few individuals were at least attempting to colonize the mountain. Other nesting localities in central California are scattered through the Coast Range, the nearest being that for Hastings Reservation, Monterey Co. Even there it has only recently become established (Davis et al. 1980). San Benito Mountain's arid coniferous forest provides very limited potential nesting habitat for the species.

SOLITARY VIREO (*Vireo solitarius cassinii*). This species breeds very locally in the San Benito Mountain region, mainly in the deep ravine of the East Fork of San Carlos Creek between 4000 and 4200 ft elevation. There, two pairs and a single male were stationed in May 1984. All three males sang steadily from fixed positions in the canyon; they were not moving through as is typical of singing migrants of this species. The birds were excited by our presence and decoyed readily to imitated Northern Pygmy-Owl calls; presumably, they had active nests in the dense woodland of Canyon Live Oaks along the stream. We collected two of these males, both in breeding condition (testis 5 x 3 mm, slight fat; 7 x 5 mm, slight fat), on 15 May 1984. On 1 June 1984, another male was singing in mixed Canyon Live Oaks and Coulter Pines at 4300 ft, on the canyon slope high above the East Fork of San Carlos Creek. The generally open and arid coniferous forest surrounding San Benito Mountain is apparently un-

suitable for nesting Solitary Vireos, although we recorded a singing migrant in such habitat along Sawmill Creek, 4300 ft, on 12 May 1983. Miller collected an immature Solitary Vireo of unknown sex (no fat) in a Digger Pine on 8 August 1944. Palmer does not mention the species.

HUTTON'S VIREO (*Vireo huttoni*). On 9 June 1983, we saw a singing Hutton's Vireo in an Incense-cedar near the summit of San Benito Mountain. A second bird may have been present nearby. Several individuals were again recorded in 1984 along the East Fork of San Carlos Creek. Males were singing steadily from Canyon Live Oaks, and an actively-breeding mated pair (male, testis 3 x 2 mm; female laying, ovary with 4 collapsed follicles, egg in oviduct ready for shell, active incubation patch) was collected on 14 May from a 20 ft oak at the headwaters of the creek, 4500 ft (1373 m). These are the first records of the species from the region. Palmer, and Miller and Storer, failed to encounter the species several decades ago. This vireo is a common resident in the luxuriant oak woodland at the Hastings Reservation, Monterey Co. Although scarce and local, the Hutton's Vireo has seemingly colonized the San Benito Mountain area within the past 40-50 years. The limited occurrence of arboreal oaks provides habitat for only a small population.

NASHVILLE WARBLER (*Vermivora ruficapilla*). According to Grinnell and Miller (1944), this warbler requires open oak or yellow pine forest for foraging and singing, and an understory of scattered shrubs to conceal and shade the nest. These authors state (1944:396) that "the combination is essential and as a consequence this warbler is usually only found in moderately open forests which permit suitable bush growth." The San Benito Mountain region locally provides these requisite habitat elements and supports a small breeding population of Nashville Warblers, as the following records document. We found four vigorously singing males in mid-May 1984. Two of these males, one of which was identified by a peculiar inflection at the end of its song, were still present on their respective territories on 1 June. These birds were patrolling territories in pine-brush or oak/pine-brush habitats, and one was seen chasing another warbler. A singing male in reproductive condition (testis 5 x 3 mm, medium cloacal protuberance, no fat) was taken from a yellow pine on 15 May at the East Fork of San Carlos Creek, 4200 ft; another individual, also in reproductive condition (testes strongly dissimilar in size: left testis 9 x 6.5 mm, right testis 1 x 0.5 mm; large cloacal protuberance, no fat), was taken on 1 June at the same locality. Our records represent the first for the San Benito Mountain region. The nearest known probable breeding localities for this species occur to the north in the Inner Coast Range of Lake Co. (vicinity of Crockett Peak, N.K. Johnson MS), and to the south in the vicinity of Pine Mountain, Ventura Co. (Garrett and Dunn 1981). To the east, this warbler breeds commonly on the west slope of the Sierra Nevada.

YELLOW-RUMPED WARBLER (*Dendroica coronata*). Palmer failed to record this warbler in 1936. However, Miller (MS) collected a male (testis 1 mm, no fat) in a yellow pine 1 mile southeast of the summit, at approximately 4400 ft, on 10 August 1944. In examining the specimen, he noted that "judging from its condition of molt it may be a local summer resident." Records obtained in 1984 strengthen Miller's suspicion. On 17 May, a singing male in breeding condition (testis 8 x 6 mm, very large cloacal protuberance) was taken near San Carlos Creek at 4200 ft (1281 m); a female was seen near this site later that morning. While these individuals could have been late migrants, the evidence suggests that Yellow-rumped Warblers possibly breed in the region. The habitat of open yellow pine appears to be at least marginally suitable for a small summer resident population. Nesting records of the species exist for Monterey Co. in the "yellow pine belt at the summit of coastal slopes" (Grinnell and Miller 1944:403), and Davis et al. (1980) also note that the "Audubon's Warbler nests within 3 km of the [Hastings] Reservation."

BLACK-THROATED GRAY WARBLER (*Dendroica nigrescens*). This warbler breeds in a variety of habitats from oak woodland and open coniferous forest to pinyon-juniper woodland. Mixed chaparral is often a common component of the habitat. Warm and at least moderately arid conditions seem essential wherever the species occurs (Grinnell and Miller 1944:404-405). Thus, on San Benito Mountain, the open yellow pine forest and/or mixed yellow pine-Canyon Live Oak association, with an understory of manzanita, scrub oak and other species of brush, appears ideal. In June 1936, Palmer recorded (MS) Black-throated Gray Warblers as "common in the conifers." He collected a male (testis 6 x 4 mm) on 12 June at 1 mile southeast of the summit, 4400 ft. D.H. Johnson took a male at the same place on 20 June. This species was again encountered fairly regularly in August 1944, when Storer reported (MS) scattered families and a few single birds. Miller collected an immature female on 7 August near the summit of San Benito Mountain, 5000 ft. Fifty years later, the Black-throated Gray Warbler is still present on the mountain but in reduced numbers. A singing male was found on 9 June 1983 in a yellow pine at 4800 ft, and several other individuals were recorded in May-June 1984. On 13 May, a silent bird was seen in the brush below San Benito Peak, and another was present on 15 May in mixed yellow pine-Canyon Live Oak-chaparral on the canyon slope above the East Fork of San Carlos Creek, 4500 ft. A third individual was seen on 1 June in a yellow pine near the upper East Fork, 4200 ft. Some or all of these birds, except for the singing individual, were doubtless spring migrants. Although the species still breeds in the San Benito Mountain region, the records indicate a substantial decline in the nesting population between 1936 and 1983-84.

WESTERN TANAGER (*Piranga ludoviciana*). Miller and Storer first recorded the Western Tanager on San Benito Mountain, although the species nests on Santa Lucia Peak, Monterey Co. (Grinnell and Miller 1944:440). On 11 August 1944, they noted (MS) one calling at 1 mile southeast of the summit, 4400 ft. Apparently the species was scarce then and, in light of the late summer date and the lack of specimens, it may not have been breeding. In contrast, in May and June 1983-1984, a large population of Western Tanagers was established for breeding on San Benito Mountain. Five to ten individuals were recorded on a single day, including nine birds during our 3-mile transect. Most of these tanagers were vigorously singing males, but several pairs were observed and a female was seen carrying nest material on 16 May 1984 near San Carlos Creek. A breeding male (testis 12 x 8.5 mm, enlarged cloacal protuberance, no fat) was taken from a yellow pine near the East Fork of San Carlos Creek, 4300 ft, on 15 May 1984. This species has increased dramatically on San Benito Mountain in recent decades and we strongly suspect that colonization of the region took place since Palmer's work in 1936.

BLACK-CHINNED SPARROW (*Spizella atrogularis caurina*). This subspecies of the Black-chinned Sparrow breeds at only a few localities in west-central California and was considered "rare" by Grinnell and Miller (1944:518). Evidently, the metropolis of the form *S. a. caurina* occurs on San Benito Mountain. *S. a. caurina* was first encountered in the region by Palmer in mid-June 1936, when he recorded seeing 10 or more individuals in the mixed chaparral between 4400 ft and the summit (5241 ft). He also noted the species from 1 mile south of Santa Rita Peak, 4500 ft (1373 m). During the same 2-week period, Palmer collected three adult males (left testis lengths 6 x 3 to 7 x 4 mm), one juvenile male, and one female (ova enlarged), all from San Benito Mountain. Palmer's records were reported in Grinnell and Miller (1944:518). Miller failed to record the species in August 1944. However, because Black-chinned Sparrows are most easily detected by the singing of males, it is probable that he overlooked this species due to the timing of his visit in late summer. In 1983 and 1984, we found males singing fairly commonly in the chaparral at the same localities as Palmer's observations. Thus, it appears that the Black-chinned Sparrow has maintained a substantial

breeding population in the region for at least the past 50 years. In view of the very local distribution of *S. a. caurina*, we are pleased to report the good health of the San Benito Mountain population. Unfortunately, the increasing degradation of brushlands in the region by extensive mining, especially near Santa Rita Peak, and by trailbikes and other off-road vehicles, poses a distinct threat to this isolated population.

SAGE SPARROW (*Amphispiza belli*). Palmer in 1936, and Miller and Storer in 1944, collected a series of specimens of this species high on San Benito Mountain. Miller identified these as intergrades between *A. b. canescens* and *A. b. belli* (Grinnell and Miller 1944:501). Because the skins were determined to be intermediates, we were originally prompted to visit this region to inspect the habitat where the sparrows were found. Typical populations of *canescens* and *belli* differ strikingly in this regard; *canescens* prefers shadscale scrub and *belli* occupies chaparral primarily comprised of Chamise (*Adenostoma fasciculatum*). Surprisingly, although we searched for several days in the exact places where the earlier workers found the species very commonly, none could be found. Although San Benito Mountain is cited as a breeding locality for the species, we doubt that they have ever nested there. The four specimens taken by Palmer, and the series of skins taken by Miller and Storer, were all in non-breeding condition, based on examination of gonads. This is understandable for the August series taken by the latter workers, but it is surprising that none of Palmer's June birds showed breeding activity. Perhaps San Benito Mountain is not a breeding area but rather is a site where post-breeding groups congregate after nesting at lower elevations, either in shadscale scrub in the San Joaquin Valley to the east or in *Adenostoma* chaparral in the southern Diablo Range. Miller also mentioned (MS) that the Sage Sparrows he found on San Benito Mountain occurred in large flocks, a point which further suggests possible post-breeding movement into the area. Therefore, we may have failed to record the species because our visits were prior to this postulated uphill movement by post-breeders.

DARK-EYED JUNCO (*Junco hyemalis pinosus*). As Grinnell and Miller (1944:510-511) described, juncos of the subspecies *J. h. pinosus* are distributed interruptedly in west-central California, with the population on San Benito Mountain being especially isolated. All ornithologists who have visited the region, starting with Palmer in 1936, have reported the species. Palmer (MS) found them "In flocks for the most part, 10-15 in number [and] usually in heaviest stands of conifers or very brushy gulches with streams." He collected an adult male in breeding condition (testis 8 x 5 mm) on 9 June and juveniles on 12 and 18 June. Miller (MS) took two adult females on 6 and 8 August 1944, and also reported flocks as well as adults with nearly independent young. Storer (MS) collected an adult male (testis 1 mm) on 8 August and stated that the species was fairly common and most numerous near streams. In 1983 and 1984, Dark-eyed Juncos were common; 11 were found along the transect of 17 May 1984. A male taken on 13 May 1984 was breeding (testis 7 x 5 mm, large cloacal protuberance). No change in historical status is indicated.

PURPLE FINCH (*Carpodacus purpureus*). The Purple Finch was one of the most abundant species on San Benito Mountain in 1983 and 1984. In a single day we recorded five to ten vigorously singing males and up to 21 individuals along the 3-mile transect. Most of these finches were in mated pairs, and a female was seen carrying nest material on 16 May 1984 near San Carlos Creek at 4200 ft (1281 m). A small series of specimens, all of which were at the peak of reproductive condition, was taken between 13 May and 17 May 1984. The finches preferred clumps of conifers scattered through mixed chaparral, the latter including several berry-producing shrubs that probably were an attractive food source. Unexpectedly, Palmer did not list the species in 1936. Miller stated in 1944 (MS) that Purple Finches were "heard all day at camp," and he took an immature female at 4400 ft on 10 August. Because Miller's records were from late summer, they provide no certain evidence for breeding status. These

data strongly point to a substantial increase in the breeding population of this species since 1936. Indeed, this finch may have colonized San Benito Mountain sometime between 1936 and 1944. This locality defines the eastern edge of the nesting distribution of Purple Finches in the Inner Coast Range of south-central California.

CASSIN'S FINCH (*Carpodacus cassinii*). On 13 May 1984 we collected a steadily singing male (testis 9 x 7 mm) in a yellow pine along Sawmill Creek, 1 mile southeast of San Benito Mountain, 4400 ft. Several other probable Cassin's Finches were subsequently seen along San Carlos Creek on 16 May in mixed forest of yellow pine and Incense-cedar with an understory of manzanita-scrub oak. Although this finch probably nests in the area, additional evidence is needed. Summer residence has also recently been suggested for Chews Ridge in Monterey Co. (DeSante and LeValley 1971). Neither Palmer in 1936 nor Miller and Storer in 1944 reported this finch for the San Benito Mountain region.

HOUSE FINCH (*Carpodacus mexicanus*). Although less numerous in 1983 and 1984 than its sibling species, the Purple Finch, the House Finch used pine and brushland habitat on San Benito Mountain apparently identical to that occupied by *C. purpureus*. Both species occurred side by side; males of either sang persistently from conifer tops and intraspecific chases were noted through the foliage in space occupied by the other congener. Mated pairs were also commonly observed in these areas. In view of such local sympatry of the two species *in the same habitat* during the nesting season, San Benito Mountain would be an ideal place to study their interactions. A small series of specimens was taken during our visit between 14 May and 17 May 1984, all of which were in reproductive condition. Palmer in 1936 and Miller and Storer in 1944 also recorded the House Finch.

LESSER GOLDFINCH (*Carduelis psaltria*). This species, a common resident of the Inner Coast Ranges of California (Grinnell and Miller 1944:461-462), has definitely increased in abundance on San Benito Mountain within the past half-century. Palmer recorded only four or five individuals and collected a breeding female (ovum 5 x 4 mm) during his 2-week stay on the mountain in 1936. Similarly, Miller and Storer found the species in 1944 but not in unusual numbers. In contrast, the Lesser Goldfinch seemed to be among the most abundant species in the region in 1983 and 1984. During our June 1983 visit we found at least 40 individuals in the pines and shrubs; these were actively chasing in small groups or in pairs. On 9 June, we collected a female in breeding condition (ovum 8 mm). Pairs and singing males were again commonly encountered in May 1984, and on 16 May a male was taken (testis 6 x 6 mm, large cloacal protuberance) near San Carlos Creek, 4400 ft. The reason for this impressive increase in numbers is unknown, although the open forest and brushland seem ideal for the species according to the habitat description of Grinnell and Miller (1944:412).

LAWRENCE'S GOLDFINCH (*Carduelis lawrencei*). This species was also very common on San Benito Mountain in 1983, although it was not as abundant as its congener. On 8-9 June, we observed at least 25 birds in the pine and chaparral habitat, many of which were in interacting pairs or in social groups mixed with Lesser Goldfinches. We also saw several pairs during our trips in May of 1983 and 1984. On 16 May 1984, a breeding male was taken (testis 6 x 4 mm, cloacal protuberance) along San Carlos Creek, 4400 ft. Such numbers represent a substantial increase in the population within the past 40-50 years. Palmer failed to observe any Lawrence's Goldfinches in the region in 1936. Miller and Storer (MS) did report the species in 1944, but without commenting on numbers present.

DISCUSSION AND CONCLUSIONS

Species richness and avifaunal resemblance. In Table 1 we compare the total number of boreal breeding bird species recorded from San Benito Mountain (14) with those from two other areas of west-central California, Monterey (33 species; Miller 1951 plus Dusky Flycatcher [Chandik and Baldridge 1969, DeSante and LeValley 1971]) and the Hastings Natural History Reservation (19 species; Davis et al. 1980). We included Hastings because it is roughly comparable in size to the San Benito Mountain region (Figure 1). Furthermore, the boreal avifauna of Hastings essentially represents a subset of that found in the adjacent Monterey District as defined by Miller (1951). Fourteen species known from Miller's Monterey component have not been recorded as summer resident at Hastings. However, a number of these species breed in the Santa Lucia Mountains only a few miles from the Reservation. Evidently, these forms require high elevations and cool-adapted forest not found at the Reserve. Such species include the Flammulated Owl, Dusky Flycatcher, Mountain Chickadee, Hermit Thrush, Yellow-rumped Warbler, Western Tanager and Pine Siskin. Other species that are missing from Hastings but found in the broader Monterey region need either (a) large permanent streams or rivers (Common Merganser), (b) heavy woodland or forest in steep-sided canyons (Spotted Owl), (c) the generally moist summer environments and associated thickets found at or near the coast (Winter Wren, Swainson's Thrush, Wilson's Warbler and White-crowned Sparrow), or (d) extensive yellow pine forest (Pygmy Nuthatch).

The avifauna of San Benito Mountain is substantially depleted relative to those occurring in the more moist and heavily-wooded Hastings and Monterey areas. This is largely in keeping with its isolation near the western border of the arid San Joaquin Valley. Among the species lacking from the mountain are the Sharp-shinned Hawk, Chestnut-backed Chickadee, Brown Creeper and MacGillivray's Warbler. All of these nest in both coastal locations but apparently do not breed at San Benito Mountain because of the comparatively stunted and highly insolated conifers there. Another species, the American Dipper, may be excluded from the region because of excessive annual fluctuations in streamflow volume and possible chemical contamination of the aquatic habitat. San Benito Mountain also seems to be missing two species of small forest-woodland owls, the Northern Pygmy-Owl and Flammulated Owl. We recorded only the Western Screech-Owl (*Otus kennicottii*) and Northern Saw-whet Owl during several nights of persistent hunting by means of imitated calls. More intensive searching of the conifers would likely reveal the Northern Pygmy-Owl; Johnson has recorded this species in similarly inferior conifer stands at several localities in the western United States. *Otus flammeolus,* on the other hand, may not occur, especially in view of the current scarcity of mature conifers in the logged and burned forest. In comparing the boreal avifaunas of the three regions, it was further noted that some species inhabit San Benito Mountain but are absent from either the Monterey District and/or the Hastings Reservation. Of these, the Nashville Warbler is the only species that breeds on San Benito Mountain but not in the other two areas; the Dusky Flycatcher, Pygmy Nuthatch and Western Tanager are shared with Monterey but do not nest at Hastings.

Table 1. Probable breeding species of boreal birds.[a]

	MONTEREY[b]	HASTINGS RESERVATION[c]	SAN BENITO MTN.[d]
1.	Common Merganser (*Mergus merganser*)		
2.	Sharp-shinned Hawk (*Accipiter striatus*)	X	
3.	Mountain Quail (*Oreortyx pictus*)	X	[X][e]
4.	Flammulated Owl (*Otus flammeolus*)		
5.	Northern Pygmy-Owl (*Glaucidium gnoma*)	X	
6.	Spotted Owl (*Strix occidentalis*)		
7.	Northern Saw-whet Owl (*Aegolius acadicus*)	X	X
8.	Hairy Woodpecker (*Picoides villosus*)	X	X
9.	Olive-sided Flycatcher (*Contopus borealis*)	X	X
10.	Western Wood-Pewee (*Contopus sordidulus*)	X	X
11.	Dusky Flycatcher (*Empidonax oberholseri*)		X
12.	Western Flycatcher (*Empidonax difficilis*)	X	X
13.	Violet-green Swallow (*Tachycineta thalassina*)	X	X
14.	Steller's Jay (*Cyanocitta stelleri*)	X	X
15.	Mountain Chickadee (*Parus gambeli*)		
16.	Chestnut-backed Chickadee (*Parus rufescens*)	X	
17.	Pygmy Nuthatch (*Sitta pygmaea*)		X
18.	Brown Creeper (*Certhia americana*)	X	
19.	Winter Wren (*Troglodytes troglodytes*)		
20.	American Dipper (*Cinclus mexicanus*)	X	
21.	Swainson's Thrush (*Catharus ustulatus*)		
22.	Hermit Thrush (*Catharus guttatus*)		
23.	American Robin (*Turdus migratorius*)	X	
24.	Wrentit (*Chamaea fasciata fasciata*)	X	[X][f]
25.	Solitary Vireo (*Vireo solitarius*)	X	X
	[Nashville Warbler][g]		X
26.	Yellow-rumped Warbler (*Dendroica coronata*)		
27.	MacGillivray's Warbler (*Oporornis tolmiei*)	X	
28.	Wilson's Warbler (*Wilsonia pusilla*)		
29.	Western Tanager (*Piranga ludoviciana*)		X
30.	White-crowned Sparrow (*Zonotrichia leucophrys*)		
31.	Dark-eyed Junco (*Junco hyemalis*)	X	X
32.	Purple Finch (*Carpodacus purpureus*)	X	X
33.	Pine Siskin (*Carduelis pinus*)		
	TOTAL NO. SPECIES	19	14

[a] Nomenclature follows 6th edition of the AOU Check-list (AOU 1983).

[b] From Miller (1951:584-587), except for species 4, 6, 7 and 25, the first 3 of which were recorded subsequently. The Solitary Vireo has long been known to breed in the Monterey region and was apparently overlooked by Miller.

[c] From Davis et al. (1980).

[d] Based on present study.

[e] Introduced, and thus not included in total for number of species; see species account.

[f] Non-boreal subspecies occurs.

[g] Species not known to breed in Monterey region.

Finally, we note that several species (American Robin, Yellow-rumped Warbler and Cassin's Finch) are either attempting to colonize or are possibly established as breeders in small numbers on San Benito Mountain; thus, the nesting avifauna of this region may actually be somewhat richer than we now conclude.

A quantitative method for judging avifaunal resemblance among various regions is provided by the calculation of similarity coefficients (Table 2). We attempted several approaches, each of which incorporates different information: (1) Jaccard's (1902 and 1908) Coefficient of Community; (2) Simple Matching Coefficient (Sneath and Sokal 1973); (3) Simpson's (1943) Index; and (4) Schilder's (1955) Index. However, only the results obtained with Jaccard's Coefficient and the Simple Matching Coefficient are presented here. These techniques are compared by Sneath and Sokal (1973:129-133) and by Udvardy (1969:273).

Table 2. Similarity coefficients for avifaunas of four areas of California. Upper right triangular matrix, Jaccard's (1902) Coefficients.[a] Lower left triangular matrix, Simple Matching Coefficients[b] (Sneath and Sokal 1973). For either of these coefficients, a value of zero indicates complete avifaunal dissimilarity and a value of one indicates total avifaunal resemblance.

	1.	2.	3.	4.
1. Monterey	----	0.58	0.38	0.47
2. Hastings Reservation	0.79	----	0.43	0.26
3. San Benito Mountain	0.69	0.81	----	0.21
4. Yosemite National Park[c]	0.47	0.26	0.22	----

[a] $S_j = \dfrac{c}{a+b-c}$

where a is number of species in larger fauna, b is number of species in smaller fauna, and c is number of species in common. Numbers of species shared by each pair of the four areas are as follows: Monterey-Hastings, 19; Monterey-San Benito Mountain, 13; Monterey-Yosemite, 32; Hastings-San Benito Mountain, 10; Hastings-Yosemite, 18; San Benito Mountain-Yosemite, 14.

[b] $S_{sm} = \dfrac{m}{m+u}$

where $m = a + s$ and $u = b + c$. a is number of shared species, b is number of species in first avifauna that are not in second avifauna, c is number of species in second avifauna that are not in first avifauna, and d is number of species missing from both avifaunas, using as a base the complete list of species found in all avifaunas (68 species, that is, the list for Yosemite [67 species] plus the boreal form of Wrentit found at Monterey and Hastings).

[c] Data from Johnson (1975:564-567), whose species list was developed from Grinnell and Storer (1924). Four additional species can be added to Grinnell and Storer's list: *Mergus merganser* and *Contopus sordidulus*, two species inadvertently omitted by Johnson; and *Parus rufescens* and *Anthus spinoletta*, two species that have recently colonized the Yosemite region.

Each method for estimating avifaunal resemblance has its merits and weaknesses. According to Udvardy, Jaccard's Coefficient tends to give a biased index where substantial discrepancies exist in the size of the different faunas. In such cases, the proportional role of the shared taxa (*c*) is much greater in the smaller fauna (*b*) than in the larger one (*a*), and the coefficient does not take this factor into account. To avoid this problem, Udvardy recommends the use of either Simpson's Index or Schilder's Index. In our opinion, results obtained from the latter two indices are misleading because they exclude important data. Although Simpson's Index evaluates the contribution of both the number of shared taxa and the absolute size of the smaller fauna, it is of limited utility because it omits consideration of the size of the larger fauna. Similarly, Schilder's Index excludes data on the number of shared taxa and thus disregards qualitative faunal differences. Furthermore, it does not incorporate information on the absolute size of the smaller fauna into its computation.

We regard Jaccard's Coefficient and the Simple Matching Coefficient as the most realistic measures of avifaunal similarity because they consider all of the information pertinent to such comparisons. Calculation of Jaccard's Coefficient includes data on the absolute size of each fauna and on its composition in terms of number of shared species. The Simple Matching Coefficient is even more comprehensive. It incorporates information on shared species (positive matches), unshared species (mis-matches), and, importantly, species missing in the two faunas being directly compared (negative matches) but occurring in at least one of the faunas in the entire comparison group.

To our analysis of avifaunal resemblance among the three areas of western California, we added Yosemite National Park in the Sierra Nevada. Yosemite supports the greatest number of boreal breeding species in California (67; Johnson 1975 and Table 2, footnote c) and therefore provides a broader perspective by which to judge similarity of the other regions. Many of these species are absent from the boreal environments in the western portion of the state. Consequently, Yosemite is the main source of negative matches between pairs of the three other avifaunas. Therefore, because the Simple Matching Coefficient considers negative matches in its computation, it is a more appropriate measure of similarity among avifaunas when Yosemite is included in the comparison. In contrast, Jaccard's Coefficient is most useful when comparing only the three western regions because it excludes negative matches from its computation.

The spatial relationship of resemblance coefficients is schematically illustrated in Figure 4. Jaccard's Coefficients (Figure 4a) clearly show a gradual avifaunal depletion eastward from Monterey, through Hastings, to San Benito Mountain. This trend matches a similar depletion in bird species richness as one progresses from north to south along the California coast (Miller 1951:589). Miller attributes the latter trend to moisture and temperature gradients. Presumably, similar climatic changes inland from the coast account for the relative impoverishment of the small and local boreal avifaunas considered here. Jaccard's Coefficients also reveal a stronger avifaunal relation between Monterey and Yosemite than between Monterey and San Benito Mountain. Finally, the low coefficient connecting San Benito

Mountain and Yosemite underscores the profound break in boreal environments and associated avifaunas across the San Joaquin Valley.

Coefficients derived by the Simple Matching (S_{sm}) approach are very similar in magnitude to Jaccard's Coefficients (S_j) for any pairwise comparison in which Yosemite is involved (Figure 4b). For example, S_{sm} and S_j for both Monterey and Hastings versus Yosemite are identical. However, values of S_{sm} are higher and more uniform than those of S_j when comparing any two of the three smaller avifaunas. This difference arises from the disproportionate influence of negative matches (*d*) between pairs of coastal avifaunas, caused by the missing Yosemite species. The S_{sm} data point to a strong avifaunal resemblance among Monterey, Hastings and San Benito Mountain. In addition, these coefficients again reveal the substantial dissimilarity in avifaunas divided by the San Joaquin Valley.

Temporal change. The data strongly suggest that the breeding avifauna of San Benito Mountain has changed markedly since the surveys of the region in 1936 and 1944. This change has involved both the composition of the avifauna and the relative abundance of particular species. We recorded eight species that were not previously known as summer residents on the mountain: Northern Saw-whet Owl, Dusky Flycatcher, Gray Flycatcher, Pygmy Nuthatch, Solitary Vireo, Hutton's Vireo, Nashville Warbler and Western Tanager. In addition, seven other species appear to have increased in numbers within the past 50 years: Olive-sided Flycatcher, Western Wood-Pewee, Violet-green Swallow, Steller's Jay, Purple Finch, Lesser Goldfinch and Lawrence's Goldfinch. Finally, three species, two of them formerly common or even abundant, have apparently either vanished or become very scarce on San Benito Mountain in recent decades: Purple Martin, Blue-gray Gnatcatcher and Black-throated Gray Warbler.

As one examines these changes more closely, a pattern becomes evident. Most of the species that are either new to the mountain (6, or 75%), or are

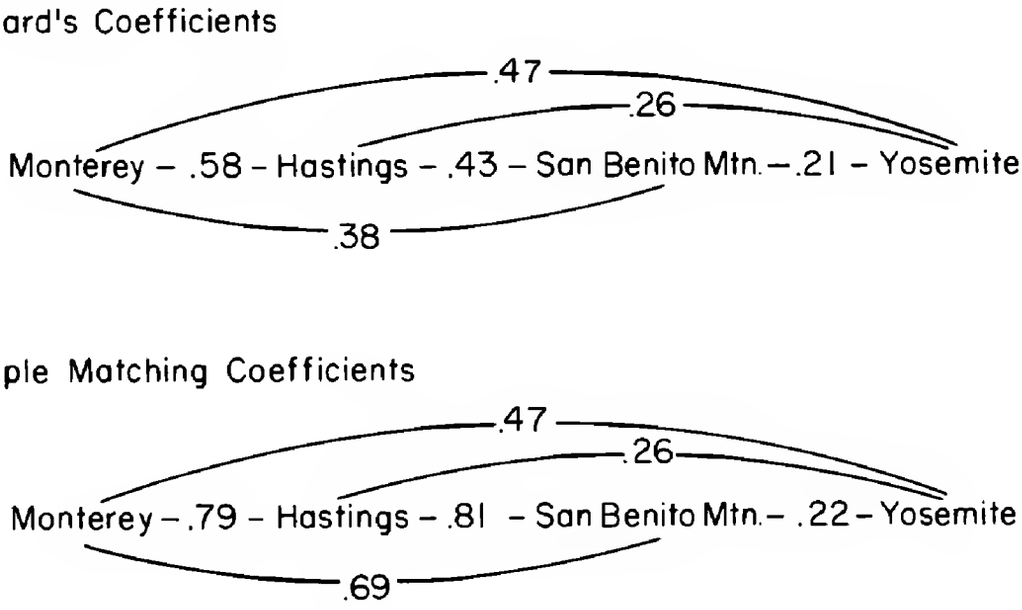
a. Jaccard's Coefficients
.47
.26
Monterey – .58 – Hastings – .43 – San Benito Mtn. – .21 – Yosemite
.38
b. Simple Matching Coefficients
.47
.26
Monterey – .79 – Hastings – .81 – San Benito Mtn. – .22 – Yosemite
.69

Figure 4. Schematic illustration of the spatial relationships of the four boreal avifaunas and of their resemblance as measured by similarity coefficients.

currently more abundant (5, or 71%), represent boreal forms characteristic of cool, moist environments. Therefore, fully 79% of the present boreal avifauna consists of species that have either arrived or increased in numbers in the past half-century. Importantly, no boreal species present in 1936 has diminished in numbers in the ensuing decades. Furthermore, the three species currently attempting to colonize (American Robin, Yellow-rumped Warbler and Cassin's Finch) are also boreal forms. Only the Northern Saw-whet Owl is suspect; it could have been present but overlooked in 1936. The remaining two new additions, the Hutton's Vireo and Gray Flycatcher, although not considered to be of boreal derivation, are adapted to cool habitats in either the oak woodlands or in the elevated valleys and highlands of the interior of the western United States, respectively. Another related trend is shown by the three species unexpectedly missing or scarce on San Benito Mountain in 1983. All of these are associated with either warm and/or arid environments. Thus, these avifaunal losses are directly opposite in kind to the gains we observed in the latest censuses. Furthermore, we stress that the species previously recorded as being *most abundant on the mountain,* the arid-adapted Blue-gray Gnatcatcher, is now *very scarce.* In sharp contrast, several cool-adapted species that were formerly absent or uncommon, such as the Western Wood-Pewee, Dusky Flycatcher and Purple Finch, were among the most abundant forms in 1983 and 1984!

The conclusion is inescapable that we have witnessed a broad adaptive response by the high-elevation avifauna of San Benito Mountain to a pervasive environmental change occurring within the last 50 years. One plausible explanation is that the habitat has undergone substantial modification over one-half century, either naturally or through human perturbation. Evidence of extensive logging in the region around the turn of the century and before is provided by existing stumps and by early records (Griffin 1974). Jepson wrote in 1907 (*in* Griffin 1975:7) that "the trees have been logged clean for the mines, even the 6-inch stuff taken for logging." Griffin (1975:43) discusses conifer reforestation in October 1910 in the Clear Creek area of San Benito Mountain. He also notes that *Pinus jeffreyi* was "probably more dominant prior to the heavy logging for mine timbers." One habitat change that is difficult to assess is the removal of most of the old-growth timber. Griffin (1974) provides evidence that large old Incense-cedars and Jeffrey Pines were once much more common than at present. Virtually all of the San Benito forest is now second-growth.

Another factor could have been fire. In 1936, Palmer noted (MS) a large burn at Santa Rita Peak. Similarly, Miller stated (MS) in 1944, in reference to a spur running northeast from San Benito Mountain, that "a fire has swept the southeast slope to the crest." It is probable that some of these habitat modifications would have altered the environment in ways selectively favorable to particular species of birds. For example, subsequent chaparral regeneration in the burned areas would have encouraged populations of the Blue-gray Gnatcatcher, a species that both Palmer and Miller reported in numbers. Moreover, as the density of brush increased and as young conifers began to invade, the acreage of habitat appropriate for gnatcatchers would have declined while its suitability for species such as Dusky Flycatchers and Purple Finches would have increased. Natural succession and the eventual

colonization of conifer seedlings on at least some logged or burned sites also would then allow forest-adapted species to invade.

Despite the effects of logging and fire evident early in this century, the field notes of Palmer and of Miller and Storer clearly describe the presence of extensive forest and rich brushland habitats suitable for boreal birds in the San Benito Mountain region in the 1930s and 1940s. Consequently, we prefer another explanation for the avifaunal dislocation. Because of the particular combination of species involved in this secular change, the underlying cause may have been a shift in recent decades toward cooler and more moist summer climates. Two other studies are relevant to this explanation. Ten years ago, Johnson and Garrett (1974) published data to document the westward spread of eight interior bird species into southern California, including seven boreal forms and the Gray Flycatcher. These authors attributed the expansion to "some complex pattern of change in recent decades of spring and summer average moisture and temperature regimes . . ." (Johnson and Garrett 1974:54). In addition, Johnson (1974) demonstrated that a striking increase in boreal species had occurred between 1939-1940 and 1971 in the Grapevine Mountains and on Potosi Mountain, southern Nevada. He speculated (Johnson 1974:336) that, "we are witnessing the recovery in recent years of Boreal faunas which were reduced in diversity sometime prior to the census of 1940, perhaps by the deleterious environmental effects of the relatively warm-dry period of the 1930s." The new and parallel findings from San Benito Mountain provide clear evidence to support these earlier suppositions. Former speculation can now be transformed into a working hypothesis.

Since the aforementioned papers, a publication has appeared (Diaz and Quayle 1980) that confronts the issue squarely by presenting substantial information on climatic change in the United States from 1895 through 1977. This elaborate analysis reveals three distinctly different periods in terms of temperature: (1) 1895-1920, cooler than average temperatures; (2) 1921-1954, warmer than average temperatures; and (3) 1955-1977, reversal to cooler than average temperatures. Importantly, all of the early surveys of the Grapevine Mountains, Potosi Mountain and San Benito Mountain fall within the warm middle period, and all of the later censuses from the same three regions occurred during or after the cool, more recent period. Despite geographical and seasonal variation in the climatic data, the information offered by Diaz and Quayle for the far West is fully compatible with the suggestion of decreased average spring and summer temperatures since the mid-1950s.

The patterns of moisture are generally more complex and difficult to interpret. Nonetheless, Diaz and Quayle (1980:259) conclude that "average summer precipitation in the far western United States was greater in the recent period compared to the previous one," and that winter precipitation increased in the Northwest.

Diaz and Quayle present two other conclusions of relevance to the present study. First, they show that the recent period has been relatively more stable (reduced variance) in average temperature and total precipitation. This suggests that the cooling trend that has occurred since 1955 represents an unambiguous environmental shift, one striking enough to have led to a more

defined avifaunal displacement than might otherwise have been the case. Second, Diaz and Quayle (1980:264) report that "in the recent cooling period, the greatest drop in mean temperature occurred essentially over those areas that reflected the greatest increases during the warm interval." We regard this finding as especially significant and exciting. In particular, it implies that if the greatest extremes between warm-arid and cool-moist climates were reached in the same region, then the magnitude of secular environmental change necessary to drive the kind of avifaunal response described here would have been perfectly plausible.

SUMMARY

We review the breeding avifauna of the isolated San Benito Mountain region, southern Diablo Range, San Benito and Fresno counties, California. Field notes and specimens resulting from concentrated field work in 1936 and 1944, and preserved in the Museum of Vertebrate Zoology, allowed assessment of the avifauna as it existed approximately ½ century ago. These data are compared in detail with new information gathered in May and June of 1983-1984. The boreal avifauna of San Benito Mountain is contrasted with those of Monterey and the Hastings Reservation to the west, and with that of Yosemite National Park to the east. Species richness of the four regions is compared, and avifaunal similarity is measured by Jaccard's Coefficient and the Simple Matching Coefficient. The avifauna of San Benito Mountain is substantially depleted relative to those of Monterey and Hastings, and it contains only 21% of the boreal species known from Yosemite. Most of the species missing from the region require dense forest, moist thickets and/or aquatic habitats, either at low or high elevations. Such habitats on San Benito Mountain are either limited or impoverished, or are lacking altogether. The similarity coefficients illustrate avifaunal depletion from Monterey inland, through Hastings, to San Benito Mountain. In addition, they underscore the strong break in boreal environments and associated avifaunas across the arid San Joaquin Valley.

A comparison of the censuses of 1936 and 1944 with those for 1983-1984 reveals that striking avifaunal changes have occurred in the San Benito Mountain region over the interval of approximately ½ century. Eight species of probable colonists, and several other forms that have increased profoundly in numbers, are nearly all species of boreal derivation. Three other species, two of which were recorded as being common or abundant in 1936 and 1944, have either declined in numbers or vanished from the mountain; these forms are typically associated with warm and arid environments. Although habitat disruption from fire and logging may have influenced the occurrence of some species, we conclude that the major avifaunal shift is attributed to secular climatic change. The reduced average temperatures and increased winter and summer precipitation recorded in the western United States since 1955 appear to have dramatically improved environments for boreal species. Apparently we are witnessing a widespread and ongoing adaptive response by mountaintop avifaunas to these more favorable conditions.

ACKNOWLEDGMENTS

We are greatly indebted to Dennis Medlin who accompanied us during all of the field work and who assisted in many ways. David DeSante and James R. Griffin kindly read the manuscript and offered many useful comments. Michael Green called to our attention a crucial reference. Dr. Jon Earhart provided useful information on chemical contamination of water. Bonnie Resnick typed the manuscript and Gene M. Christman assisted in the preparation of the figures. Funds for field expenses were provided by the National Science Foundation through Grant D.E.B. 79-20694 to Johnson (the first author).

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Accepted 1 August 1984

Black-chinned Sparrow *Sketch by Narca Moore-Craig*

Northern Hawk-Owl (*Surnia ulula*) at Cantwell, just outside Denali National Park, Alaska, 17 June 1982. This immature was one of three Roger Harris found in a nest on top of a 3-m broken top snag 3 days earlier. On 17 June the three young were on the ground, with an adult in close attendance—see cover photo, *Western Birds* 15(2), 1984.

Photo by Roger D. Harris

CHANGES IN DISTRIBUTION OF OWL SPECIES SUBSEQUENT TO HABITAT ALTERATION BY FIRE

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Information on the effects of major habitat change on the distribution of owls is generally lacking. The result may be that marked changes in density or local distribution go unnoticed. I have compiled records and subjective impressions from several observers near China Camp Forest Service campground during a period interrupted by a major forest fire. This information is particularly valuable when it pertains to the California Spotted Owl (*Strix occidentalis occidentalis*), a subspecies which is under study by the California Department of Fish and Game and the U.S. Forest Service because of concern for its status.

China Camp, a U.S. Forest Service campground at the head of Miller Canyon, is 3.4 km south of Chew's Ridge summit on the Tassajara Hot Springs Road in the Los Padres National Forest, Monterey County, California. This area has enjoyed a reputation among local observers for the variety and abundance of its fauna. Eight species of owls have been recorded here (Table 1). Of great attraction to most observers have been the Spotted Owls, which have been easily studied here due to their prompt response to imitated or taped calls. In contrast, Western Screech-Owls were seldom noted about this location prior to the fire, although they could always be found throughout the year at lower elevations in the riparian, encinal and oak-savannah habitat a few kilometers north of Chew's Ridge in Carmel Valley.

The occurrence of various owl species in the study area may be summarized as follows: two or more pairs of Spotted Owls were noted in the vicinity of China Camp each year between June 1972 and July 1979 (Table 2). Definite evidence of local breeding was secured in 1977 prior to the fire, when a family of Spotted Owls (two adults and at least two young-of-the-year) were present. In contrast, I observed only one Western Screech-Owl near China Camp in 1973 and 1974 respectively; two may have been there in 1976 but no screech-owl was noted in the spring of 1977 prior to the fire. Northern Saw-whet Owls with two young-of-the-year were observed there on a June visit in 1977 and Roberson suspected breeding by this species in the same location in 1976 (Don Roberson pers. comm.).

In August 1977, the second largest forest fire in California history (the 77,000 HA Marble-Cone fire) effected large scale habitat changes about Chew's Ridge. The fire burned almost all the understory of the area and effectively denuded most foliage from various live oak species (*Quercus* spp.) and Tanoaks (*Lithocarpus densiflora*). The Tanoak stands on north-facing slopes had been noted as a favorite local Spotted Owl habitat.

The fire pattern limited crowning in the larger Douglas-firs (*Pseudotsuga menziesii*) in the Chew's Ridge area. Flammulated Owl habitat (as described by Marcot and Hill 1980) apparently was not markedly affected. Flammulated Owls have been almost as abundant since the conflagration as they were previously.

Table 1. Owl species and their status near the China Camp campground, Monterey County, California.

Common Barn-Owl *Tyto alba*	-vagrant (or very scarce resident)
Western Screech-Owl *Otus kennicottii*	-see text
Flammulated Owl *Otus flammeolus*	-local summer resident (19 April to August)
Great Horned Owl *Bubo virginianus*	-resident (at least two pairs)
Northern Pygmy-Owl *Glaucidium gnoma*	-resident (two singing birds)
Spotted Owl *Strix occidentalis*	-probably resident (high count: 2 pairs plus young)
Northern Saw-whet Owl *Aegolius acadicus*	-possibly resident (bred in 1977; present also in 1976 and 1981)
Long-eared Owl *Asio otus*	-one male on territory 21 May 1967 at China Camp; another heard briefly in 1977

Such was not the case with Spotted Owls—during the spring 1978 survey, only Flammulated, Northern Pygmy- and Great Horned owls were recorded. In the 1979 and 1980 breeding seasons, the latter species assemblage was noted, plus one Western Screech-Owl. In spring 1981, Spotted Owls again were detected, but the calls were all from unburned areas of Miller Canyon at lower elevations well below China Camp. One was heard here on 16 and 25 April, and two were heard on 27 June. Certainly, since the fire, the vegetation type offered no semblance of the foliage types postulated to be prime habitat for Spotted Owls (Grinnell and Miller 1974, Small 1974, Gould 1977, Barrows and Barrows 1978, Marcot and Gardetta 1980, Barrows 1981).

Also during spring 1981, a marked increase in the total number of Western Screech-Owls in the burn area was observed. Roberson noted five screech-owls near China Camp in April. During three survey nights between 2 May and 22 June, I encountered numerous individual singing screech-owls along a 2-mile survey route centered on China Camp (2 May, 4 birds; 16 June, 5 birds; 22 June, 6-7 birds). Vocalizations indicated fledged young-of-the-year soliciting feeding.

Perhaps the most significant factor influencing the apparent increased occurrence of screech-owls was the copious sprouting from the trunks and limbs of fire-blackened oaks in the spring of 1981, following three better-than-average precipitation years in the Santa Lucia Range. Sprouting occurred at middle canopy and crown height for live oaks and from the basal section of the main trunks of Tanoaks. Prior to spring 1981, most of these trees appeared moribund. Marshall (1967) noted in his discussion of the genus *Otus* in the American Southwest that periodic burning of appropriate habitat for screech-owls seemed to enhance populations.

Table 2. Number of Spotted Owls and Western Screech-Owls reported near China Camp U.S. Forest Service campground between 1972 and 1981. (Marble-Cone fire occurred in August 1977.)

	Spotted Owls		*Western Screech-Owls*	
1972		4		-
1973		4		1
1974		4 (+2?)		1
1975		4		-
1976		4		2
1977		4 (+2)		-
1978		-		-
1979		-		1
1980		-		1
1981	25 April	1 (a)*	25 April	5
			2 May	4
			16 June	5
	27 June	2 (a)*	22 June	6-7

*Reported by Roberson (pers. comm.)
(a) Birds calling from lower elevations in Miller Canyon

It must be emphasized that the methodology employed to gather the data was not a systematic uniform census, but rather a series of informal surveys by several independent observers employing heterogeneous methods. Also, Roberson's taped or imitated calls stressed owl species (Spotted, Flammulated, Northern Saw-whet) other than Western Screech-Owls; the latter could conceivably have been present and non-respondent during some or all of these field sessions.

Notwithstanding the latter caveat, the evidence still indicates that Spotted Owls abandoned their former habitat, occupied prior to the Marble-Cone fire, and shifted their distribution downslope into unburned areas near the bottom of Miller Canyon. Whether or not Spotted Owls occurred regularly in the latter area prior to the fire is unknown.

The data also suggest that the apparent increase in numbers of Western Screech-Owls in 1981 resulted from a significant increase in appropriate habitat. The seral development of an incipient oak canopy provided the appropriate niche to accommodate Western Screech-Owls in an area previously inhabited by Spotted Owls.

ACKNOWLEDGMENTS

I thank the following individuals for sharing their records and recollections of owl data from the study area: Alan Baldridge, Ronald Branson, Bill Clow, Debra Love Shearwater, William Reese, Don Roberson and Dennis Serdehely. Baldridge, Roberson, Jon Winter, Gordon Gould, Rich Stallcup and Cameron Barrows reviewed one or more drafts of the manuscript and

provided useful comment and discussion. I also thank Mary Elliott and Gail Nolan Presley for assistance in the field. I wish to dedicate this paper to the memory of the late George M. Sutton in thanks for his kind advice on a matter of mutual interest.

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Accepted 26 November 1983

Spotted, Flammulated and Pygmy Owls *Sketch by Keith Hansen*

SEVENTH REPORT OF THE CALIFORNIA BIRD RECORDS COMMITTEE

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This report of the Western Field Ornithologists' California Bird Records Committee (CBRC) contains 197 records of 78 species, divided as follows: 174 records (of 65 species) accepted; 18 (17) unaccepted, identification questionable; and 5 (5) unaccepted, origin questionable (i.e., possible escapees). A few of the accepted records involve returning birds or the reevaluation of records previously treated by the Committee. These figures represent a rejection rate of only 11.7%, which is similar to the rates in four of the six previous reports and to the overall average of 15.7%. This average is based on 1140 records treated, of which 179 were judged unacceptable (see Table 1). By way of comparison, the British Rarities Committee had an overall rejection rate of 22% during its first 10 years, with the lowest annual rate being 18% during the tenth year (Wallace 1970).

State list. Jones et al. (1981) included 541 species on the California state list. They anticipated and included all species added in the Committee's fifth report (Luther et al. 1983). The sixth report (Binford 1983) noted the addition of Gray-tailed Tattler (*Heteroscelus brevipes*) and Least Auklet (*Aethia pusilla*) and the deletion of Yellow Wagtail (*Motacilla flava*) and White Wagtail (*M. alba*). At its meeting of 18 February 1984, the Committee removed Acadian Flycatcher and Cook's Petrel; see Cook's/Mas Atierra Petrel under Accepted Records and Acadian Flycatcher in Unaccepted Records. The present report officially adds four species to the state list: Smew, Kittlitz's Murrelet, Barred Owl and Black-backed Wagtail. The California state list thus stands at 543 species.

Number of records. The number of records submitted over the years (Table 1) shows a fairly steady but not dramatic rise that I believe combines the effects of increases in the numbers of (1) active birders (plus improved awareness as to where and when to find rarities and how to identify them) and (2) people reporting to the Committee, especially subsequent to the first two reports when observers became aware of the Committee and its functions. That the number of rarities present in the state also has increased is suggested by DeSante (1983). Note that the great increase from 93 records treated in the second report to 253 in the third is at least partly a result of the 4-year time lag in publication dates and a concerted effort on the part of the Committee to obtain and validate old records.

Given these effects, an even more dramatic increase in the number of records reported might have been expected. That such is not the case appears to be a function of changes in the review list. The total number of species has changed little, from 131 in 1972, 105 in 1973, 107 in 1975, 109 in 1979, 110 in 1980, 116 in 1981, and 117 in 1983 to 122 in the present report. The net decrease of only nine species should have little effect on the number of reports. However, the *species composition* of the list has changed considerably. Forty-nine forms on the 1972 review list are not to be found on the current list. Many of these are birds that are now recorded regularly, such as Hooded Warbler (*Wilsonia citrina*) and Indigo Bunting (*Passerina cyanea*).

Table 1. The number of reporters, number of bird records and their fate, and the rejection rate in each of the first seven reports of the California Bird Records Committee.

Report No.	Reporters	Species and Subspecies	Records Treated	Records Accepted	Records Unaccepted, Identification Questionable	Records Unaccepted, Origin Questionable	Rejection Rate (%)
1[1]	25	54	99	83	16	0	16.2
2	21	54	93	90	3	0	3.2
3	110	108	253	213	32	8	15.8
4	102	66	159	135	23	1	15.1
5	113	83	174	128	45	1	26.4
6	63	62	165	138	26[2]	1	16.4
7	99	78	197	174	18	5	11.7
Totals:		190[3]	1140[4]	961[4]	163[4]	16[4]	15.7[4]

[1] Citations for reports are, respectively: Winter (1973); Winter and McCaskie (1975); Luther et al. (1979); Luther (1980); Luther et al. (1983); Binford (1983); and present paper.

[2] Includes one record published as "unresolved."

[3] Includes 29 species and 4 additional subspecies not currently on the state list of species.

[4] Figures approximate because of a very small amount of duplication.

These have been replaced by 40 ultra-rarities, all of which are very infrequently seen and over half of which have been encountered only once in the state, such as Masked Booby (*Sula dactylatra*) and Dusky Warbler (*Phylloscopus fuscatus*). Thus increases in the numbers of birders and reporters have been counteracted by a decrease in the number of reportable sightings.

Committee decisions. At its meetings of 19 February 1983 and 18 February 1984, the Committee reached four decisions that affect reporters. (1) A record of a bird returning to the same locality in successive years (or after any lengthy absence) should be submitted as if it were a separate individual (e.g., the Eurasian Skylark at Point Reyes, Marin Co.; see Accepted Records). The observer should include his opinion as to whether the same or a different individual is involved, but the final decision is up to the Committee.

(2) The "unresolved category" of the California state list (see definition in Jones et al. 1981) was abolished and the bylaws amended accordingly. Records of some of the species relegated to that category are reevaluated in the present report: Cape Petrel (54-1976), Anhinga (2-1979), American Black Duck (149-1980) and Kittlitz's Murrelet (83-1978). Another, the Black Vulture (35-1978), was published as unacceptable, origin questionable, in the sixth report (Binford 1983). The remaining unresolved records will be reexamined in the near future.

(3) A record not submitted as a single identified species (e.g., *Pterodroma* spp.) normally will not be judged by the Committee but will be placed in a "suspense file" until the Secretary feels that a specific name can be applied to it. The Secretary will so inform the reporters, who may then retract the record, submit it under a single specific name, or leave it in the suspense file. Exceptions to this rule are those species pairs added to the review list. Currently these are Cook's/Mas Atierra Petrel and White/Black-backed Wagtail. Records of these two pairs may be submitted for review and will be evaluated accordingly.

(4) A record submitted by the observer(s) involved may not be retracted after circulation has begun. The observer(s) may submit new opinions or additional data that totally or in part negate the record, and the Committee will reconsider the record accordingly.

Review List. In addition to any species unrecorded in California, the Committee requests documentation for sightings or specimens of the 122 forms on the following list. Nomenclature and sequence follow the AOU (1983). At its 1984 meeting the Committee added those forms marked with an asterisk (*) and deleted Laysan Albatross, Cook's Petrel and Painted Redstart.

Yellow-billed Loon, Least Grebe, Wandering and Short-tailed albatrosses, Mottled Petrel, *Cook's/Mas Atierra Petrel, Stejneger's Petrel, Streaked and Greater shearwaters, Wilson's, Band-rumped and Wedge-rumped storm-petrels, White-tailed and Red-tailed tropicbirds, Masked, Brown and Red-footed boobies, Olivaceous Cormorant, *Reddish Egret, Yellow-crowned Night-Heron, White Ibis, Black-bellied Whistling-Duck, Trumpeter Swan, *Emperor Goose, Baikal Teal, Gargany, Tufted Duck, King Eider, Smew, Mississippi Kite, Harris' and Zone-tailed hawks, Gyrfalcon, Sharp-tailed Grouse, Yellow Rail, Purple Gallinule, Mongolian, Wilson's and Piping plovers, Eurasian Dotterel, American Oystercatcher, Gray-tailed Tattler,

Upland Sandpiper, Hudsonian and Bar-tailed godwits, Rufous-necked Stint, White-rumped, Curlew and Buff-breasted sandpipers, Jack Snipe, Little, Common Black-headed and Lesser Black-backed gulls, Sandwich Tern, Thick-billed Murre, Kittlitz's Murrelet, Parakeet, Least and Crested auklets, Black-billed Cuckoo, Groove-billed Ani, Snowy and Barred owls, Broad-billed, Violet-crowned and Blue-throated hummingbirds, Red-headed Woodpecker, Greater Pewee, Eastern Wood-Pewee, Yellow-bellied, Dusky-capped, Great Crested and Sulphur-bellied flycatchers, Thick-billed Kingbird, Scissor-tailed Flycatcher, Eurasian Skylark, Blue Jay, Sedge Wren, Dusky Warbler, Northern Wheatear, Veery, Gray-cheeked and Wood thrushes, Rufous-backed Robin, Gray Catbird, Curve-billed Thrasher, Black-backed Wagtail, *White/Black-backed Wagtail, Red-throated and Sprague's pipits, White-eyed, Yellow-throated and Philadelphia vireos, Blue-winged, Golden-winged, Golden-cheeked, Yellow-throated, Grace's, Pine, Cerulean, Prothonotary and Worm-eating warblers, Louisiana Waterthrush, Kentucky, Connecticut, Mourning and Red-faced warblers, Scarlet Tanager, Northern Cardinal, Pyrrhuloxia, Varied and Painted buntings, Cassin's, Field, Baird's, Le Conte's and Sharp-tailed sparrows, *Snow Bunting, Common Grackle, Streak-backed Oriole, White-winged Crossbill and Common Redpoll.

Submission of records. An unfortunate and unnecessary number of probably legitimate records are rejected by the Committee because they lack sufficient details. Some rejections could be avoided if *everyone* who sees a rarity would take notes or photographs and submit them. All too often, observers assume that others will submit documentation, and all too often either they do not or their descriptions are inadequate. Different observers see and record different details, and all are useful in making Committee decisions. Photographs often sit unused in personal files while the Committee has only written documentation with which to deliberate. Please support the work of the Committee by submitting new or old, sight or specimen records to Secretary B.D. (Mike) Parmeter, 2500 Emerson Street, Napa, CA 94558. Original photographs will be duplicated and returned upon request.

Voting. The following Committee members voted on some or all of the records in this report. *Laurence C. Binford (Vice-Secretary), David DeSante, *Jon L. Dunn, *Richard A. Erickson, *Kimball L. Garrett, H. Lee Jones, *Paul Lehman, John S. Luther, *Guy McCaskie, *Joseph Morlan, *B.D. Parmeter (Secretary), Arnold Small, Richard Stallcup, *Richard E. Webster and Philip Unitt. Those marked with an asterisk (*), as well as Don Roberson, were Committee members after the meeting of 18 February 1984.

Format. I have followed the same format and techniques detailed in the Committee's sixth report (Binford 1983), to which the reader is referred, except that I here employ the taxonomy and nomenclature of the AOU (1983) and the more usual definitions of "juvenile" and "juvenal"; shorebirds in their first fall are termed "juveniles" and are assumed to be in mostly juvenal plumage. Briefly, all records are sight records unless otherwise noted. Species marked with an asterisk (*) are no longer being reviewed. All dates are inclusive and were gleaned not only from Committee files but also from other available sources, including *American Birds*. I list the initials of only those people who submitted written or photographic documentation (see list

of Contributors). All annotations are mine, although they are largely a distillation of information in the Committee files, and a draft of this report has been reviewed by each member of the Committee.

ACCEPTED RECORDS

YELLOW-BILLED LOON (*Gavia adamsii*). One immature (177-1980) first seen 1 Dec and found dead of *Aspergillosis* (study skin 65867, California Academy of Sciences) 11 Dec 1967 (not 12 Dec as published by Chandik and Baldridge 1968; see Remsen and Binford 1975), Inverness, Marin Co. (GMcC, JSL); photos of specimen on file; this was the first record for the state. One adult (96-1981) 18-21 Dec 1981, 3 miles northwest of Marshall, Marin Co. (LCB). One (17-1982) 17 Jan-10 Feb 1982, Berkeley, Alameda Co. (JLD, AG, JM, GMcC); photos on file.

*LAYSAN ALBATROSS (*Diomedea immutabilis*). Two (21-1981) 24 Oct 1971, one 13 and another 18 miles off Eureka, Humboldt Co. (RJ, RL); photos on file. Two (24-1981) 15 Apr 1973, 87 miles off Humboldt Bay, Humboldt Co. (RL); photos on file. One (22-1981) 18 May 1974, 5 miles west of Cypress Point and probably the same individual again 10 miles southwest of Santa Cruz (town in Santa Cruz Co.), both sightings in Monterey Co. (AB, GMcC). One (180-1980) 5 May 1976, near Desert Hot Springs, Riverside Co. (JLD, PU); this was the first inland record for North America; see Dunn and Unitt (1977) for further details. One (232-1980) 21 Mar 1978, Cordelle Banks off Marin Co. (AS); photo on file. One to three (three sightings; 168-1980) 8 Mar 1980, vicinity of Davidson Seamount (35°44'N, 122°43'W), ca. 65 miles southwest of Pt. Sur, Monterey Co. (GMcC); McCaskie (1980) and Garrett and Dunn (1981) accepted these sightings as representing three different individuals, but the Committee did not. One (169-1980) 27 Jul 1980, 25 miles southwest of Pt. Pinos, Monterey Co. (GMcC).

COOK'S/MAS ATIERRA PETREL (*Pterodroma cookii/P. defilippiana*). One (71-1979, bird #7) 17 Nov 1979, vicinity of Davidson Seamount (35°44'N, 122°43'W), ca. 65 miles southwest of Pt. Sur, Monterey Co. (JLD, RAE, GMcC, DR, RS). This was one of seven *Pterodroma* petrels reported on this pelagic trip. The Committee previously accepted bird #4 as a Stejneger's Petrel (*P. longirostris*) and birds #1 and #6 as *P. cookii* (Luther et al. 1983). Birds #2, #3 and #5 were judged unidentified (Binford 1983). Garrett and Dunn (1981) accepted four of the seven individuals as *cookii*. At its meeting of 18 February 1984, the Committee decided that all records previously accepted as *cookii* shall be treated as *cookii/defilippiana*, because *defilippiana* is now considered a full species by the AOU (1983) and could not be eliminated by the submitted descriptions. These records are 71-1979, 17 Nov 1979, birds #1, #6 and #7; 71-1979, 24 Nov 1979, two birds; 71-1979, 1 Dec 1979, one bird; and 122-1980, 3 Oct 1977, one bird. Birds #2, #3 and #5 on 17 Nov 1979 could not be allocated even to this species pair. Cook's Petrel (*P. cookii*) is thus deleted from the California state list; species pairs are not added to the state list.

WILSON'S STORM-PETREL (*Oceanites oceanicus*). One (223-1980) 11-12 Oct 1980, Monterey Bay, Monterey Co. (GMcC, DR). One (55-1981) 27 Sep, three (79-1981) 3 and 12 Oct, and one or two (also 79-1981) 17 Oct 1981, Monterey Bay off Moss Landing, Monterey Co. (JLD, GMcC, JM, JO); photos on file. These records are here treated as one record with two numbers because they probably involve the same birds. The additional published dates for this locality, 16 Sep and 19 Oct 1980 (Evens and LeValley 1981) and 6 Sep and 18 Oct 1981 (Evens et al. 1982), while probably correct, were never submitted to the Committee.

BROWN BOOBY (*Sula leucogaster*). One adult (130-1980) 24 Aug-2 Sep 1974, Whitewater River mouth, north end of Salton Sea, Riverside Co. (JLD, GMcC).

OLIVACEOUS CORMORANT (*Phalacrocorax olivaceus*). One (72-1981) 7 Sep-7 Oct 1981, near Imperial Dam, Imperial Co. (RAE, GMcC, DR); photos on file. This is only the second bird to be found in California (Garrett and Dunn 1981).

YELLOW-CROWNED NIGHT-HERON (*Nycticorax violaceus*). One (11-1982) 30 Apr-3 May 1981, Santa Clara River mouth, Ventura Co. (PL). One subadult (80-1981) 12 Sep-17 Oct 1981, Año Nuevo State Reserve, San Mateo Co. (MD, JM, BDP, DR, GMcC); photos on file. One adult (88-1981) 25 Oct 1981-3 Jan 1982, San Elijo Lagoon, San Diego Co. (JLD, GMcC).

TRUMPETER SWAN (*Cygnus buccinator*). One adult (179-1980) 13-22 Jan 1973, Ramer Lake, San Luis Obispo Co. (BS). See Schram (1973) for photo and further details.

EMPEROR GOOSE (*Chen canagica*). One (48-1980) 1 Jan-20 Feb 1978, Point Mugu, Ventura Co. (KLG, PL, GMcC).

TUFTED DUCK (*Aythya fuligula*). One (35-1981) 9-11 Nov 1978, Santa Clara River mouth, Ventura Co. (RW). One adult male (49-1980) 4 Dec 1978-26 Feb 1979 and 10 Nov 1979-8 Jan 1980, Quail Lake, Los Angeles Co. (JLD, GMcC). One adult male (71-1980) 10 Feb-23 Mar 1980, Mill Valley, Marin Co. (DR, GMcC); the date of 15 Apr 1980 given by Laymon and Shuford (1980b) may pertain to this bird. Two adult males, one on 3 Oct (237-1980; KHa, RHa), 11 Nov (Evens and LeValley 1981) and 27 Dec (44-1981; FFP) and two on 9 Nov (Evens and LeValley 1981), 28 Nov (237-1980; GMcC) and 12 Dec 1980 (LeValley and Evens 1981), Limantour Estero, Marin Co.; the sightings on 28 Nov and 27 Dec inadvertently received separate treatment by the Committee. One adult male (1-1982) 1-9 Jan 1982 (not 2-9 Jan as in LeValley and Evens 1982), Lake Hennessey, Napa Co. (BDP, JP).

KING EIDER (*Somateria spectabilis*). One immature male (228-1980) 13-28 Nov 1980 (not 13-23 Nov as in Evens and LeValley 1981), Abbott's Lagoon, Marin Co. (GMcC, DN, BDP, DS, RS); photos on file.

SMEW (*Mergellus albellus*). One male (95-1981) 19 Dec 1981-18 Feb 1982 and again 1 Dec 1982-13 Feb 1983, Foster City, San Mateo Co. (LCB, JLD, JE, RAE, AG, PG, KHi, RH, GMcC, JM); photo on file. This is the first record for California and the only record for the west coast of North America south of Alaska except for two (possibly three) in the Vancouver area, British Columbia (Weber and Campbell 1978), and one (two males) at San Juan Island, Washington (Mattocks and Hunn 1981).

MISSISSIPPI KITE (*Ictinia mississippiensis*). One adult (65-1981) 24-25 May 1981, Furnace Creek Ranch, Inyo Co. (GMcC).

ZONE-TAILED HAWK (*Buteo albonotatus*). One (40-1979) 13 Jan 1979, Whalen Lake, San Diego Co. (MT). Two adults building nest 13 Jun 1981 (69-1981) and one adult present 19 Jun-17 Jul 1982 (McCaskie 1982b), Santa Rosa Mountain, Riverside Co. (GMcC); this is believed to be the same pair present at this locality since 7 Jul 1979 and previously accepted in the Committee's sixth report (Binford 1983) under number 33-1980. One immature (77-1981) 17-19 Sep 1981, Tijuana River Valley, San Diego Co. (GMcC, RW); photo on file.

GYRFALCON (*Falco rusticolus*). One immature (16-1982) 17 Jan-8 Feb 1982, ca. 10 miles east-southeast of Dixon, Yolo Co. (CEA, LCB, SB, JLD, RAE, AG, EG, GMcC, JM, BDP, TP, JW, RW); photos on file. This is the second record for the state, the first being one collected near Tule Lake, Siskiyou Co., 23 Oct 1948 (McCaskie et al. 1979).

PIPING PLOVER (*Charadrius melodus*). One (221-1980) 1 Oct-15 Dec 1980, Morro Bay, San Luis Obispo Co. (JLD, JL, PL, GMcC, BDP); photos on file. This is the third record for California; all are from the south coast.

BAR-TAILED GODWIT (*Limosa lapponica*). One juvenile (91-1981) 4-27 Nov 1981, Coronado, San Diego Co. (JLD, KH, GMcC, JO, RW, PU); photos on file. This is the second record for southern California.

*SEMIPALMATED SANDPIPER (*Calidris pusilla*). One (98-1978) 5 Aug 1978 (not 5 Sep as published by Winter and Laymon 1979), Bodega Bay, Sonoma Co. (BDP). One (171-1980) 26 Apr 1980, Salton City, Imperial Co. (GMcC). The following is a summary of birds, all juveniles, seen in 1980 near Lancaster, Los Angeles Co. (all JLD): one (see 204-1980) 3-9 Aug; two, both new arrivals (203-1980) 15 Aug; one, new (204-1980) 17 Aug; three, two new (206-1980) 21 Aug; two, lingering (see 206-1980) 24 Aug; one, lingering (see 206-1980) 27 Aug; five, four new (209-1980) 30 Aug; photos (LS) on file; these represent a total of at least 10 different individuals treated under four records. Five juveniles (205-1980) 18 Aug 1980, Santa Clara River mouth, Ventura Co. (JLD); according to JLD (in report 205-1980 and in litt.) this species had been present here since 2 Aug, and seven were seen by RW on 17 Aug; according to McCaskie (1981a) eight were seen here by RW on 19 Aug. One (185-1980) 23-25 Aug 1980, Abbott's Lagoon, Marin Co. (JRG); photo on file. One juvenile (208-1980) 25 Aug 1980, Santa Maria River mouth, Santa Barbara Co. (JLD). Three juveniles (207-1980) 25 Aug 1980, near Santa Maria, Santa Barbara Co. (JLD).

The Committee urges observers to become familiar with plumage tracts (especially back proper, inner and outer scapulars, tertials, and lesser, median and greater upper secondary coverts) and variation in plumages (juvenal, adult basic and adult alternate) before attempting identification of the difficult species of peeps. The reader is referred to Roberson (1980) for a discussion of aging peeps and for separating Semipalmated from Western Sandpiper (*C. mauri*). One point not mentioned by Roberson is that the Semipalmated usually (always?) stands slightly lower than the Western, the difference apparently being in the length of the tibia, as the tarsi are similar.

RUFOUS-NECKED STINT (*Calidris ruficollis*). One adult in alternate plumage (42-1981) 12-17 Jul 1981, Santa Clara River mouth, Ventura Co. (JLD, JMG, KLG, GMcC, JO, DR, RW); photos on file.

WHITE-RUMPED SANDPIPER (*Calidris fuscicollis*). One adult (202-1980) 15-22 Aug 1980, near Lancaster, Los Angeles Co. (JLD, GMcC, JO, LS); photos on file; this is the first fall record for the state. One (47-1981) 6 Jun 1981, Mono Lake, Mono Co. (GP, LSt, CS).

*SHARP-TAILED SANDPIPER (*Calidris acuminata*). One juvenile (181-1980) 13-21 Sep 1969, Goleta, Santa Barbara Co. (JLA, RW); see Atwood (1970) for further details. Two juveniles (80-1979) 5-6 Nov 1979, east end of Dumbarton Bridge, Palo Alto, San Mateo Co. (TC, CS).

CURLEW SANDPIPER (*Calidris ferruginea*). One adult in partial alternate plumage (18-1981) 5 Sep 1971, Upper Newport Bay, Orange Co. (HB, DP). One adult in alternate plumage (40-1981) 4 Jul 1981, San Elijo Lagoon, San Diego Co. (JLD, GMcC, JO); photo on file. One adult in partial alternate plumage (25-1981) 1 Aug 1981, Año Nuevo State Reserve, San Mateo Co. (JR, DES); photos on file. One juvenile (52-1981) 28-29 Aug 1981, near Fort Dick, Del Norte Co. (RAE, GSL). One adult in partial alternate plumage (74-1981) 31 Oct-1 Nov 1981, near Fernbridge, Humboldt Co. (RAE, RPK).

Record 18-1981 produced useful discussion. One of the two observers was not sure of the identification, a circumstance that some Committee members feel is possible grounds for rejection. In this case, however, the qualms were interpreted as commendable caution. Three important points concerning identification emerged. (1) Unlike many calidrids, the Curlew Sandpiper can retain a conspicuous amount of alternate plumage well into fall, often into September and at least occasionally to early

November (as evidenced by record 74-1981). (2) The contrast between rump and tail is often much less than indicated by most field guides. The white of the rump can be finely barred, thus rendering it slightly dusky, and the tail can be pale grayish-brown. (3) The undertail coverts and flanks need not, as usually depicted, be pure white in alternate plumage but may be sparsely to liberally spotted with dusky. The statement by Balch (1981) that the Curlew Sandpiper "is always white" under the tail is incorrect, as evidenced by specimens and by descriptions in both the literature and CBRC files.

BUFF-BREASTED SANDPIPER (*Tryngites subruficollis*). One (161-1980) 9 Oct 1979, Tijuana River Valley, San Diego Co. (GMcC); because of plumage differences, this bird was believed not to be one of the two listed under record 160-1980. One 12-22 Oct and another 16-22 Oct 1979 (160-1980; birds together on latter dates), Tijuana River Valley, San Diego Co. (GMcC). One (50-1981) 25 Sep 1981, Lake Talawa, Del Norte Co. (RAE, GSL).

*RUFF (*Philomachus pugnax*). One, probably a male (167-1980) 19 Jan-23 or 30 Mar 1980, Pt. Mugu, Ventura Co. (JLD, GMcC); because two presumed males and one female were present at this locality this winter, with one male last seen 23 Mar (REW) and the other male 30 Mar (REW), the last date for male 167-1980 is uncertain. One juvenile (1-1981) 14-22 Sep 1980, Limantour Estero, Marin Co. (RS); photo on file. One adult (2-1981) 27-30 Sep 1980, Salinas River mouth, Monterey Co. (RS). One juvenile (3-1981) 28 Sep 1980, Watsonville, Santa Cruz Co. (RS); only one bird was present at this locality, contra the typographical error in Evens and LeValley (1981). One juvenile (210-1980) 21-26 Oct 1980, near Lancaster, Los Angeles Co. (JLD). One (211-1980) 26 Oct 1980-21 Feb 1981, near Santa Maria, Santa Barbara Co. (JLD, PL, GMcC). One (212-1980) 31 Oct 1980-16 Feb 1981, near Santa Maria, Santa Barbara Co. (JLD, PL, GMcC); photo on file.

LITTLE GULL (*Larus minutus*). One adult (239-1980) 22 Nov-21 Dec 1980, Huntington Beach, Orange Co. (GMcC). One in first basic plumage (58-1981) 24 Jan 1981, Huntington Beach, Orange Co. (GMcC, JO); photos on file. One in juvenal plumage (51-1981) 15 Aug 1981, Crescent City, Del Norte Co. (GSL, JMa); this may be the only record for a juvenile in western North America; the plumage and date suggest that this species may breed closer to California than suspected.

COMMON BLACK-HEADED GULL (*Larus ridibundus*). One adult (219-1980 and 59-1981; separate reports inadvertently given different numbers) 21 Nov 1980-25 Feb 1981, Huntington Beach, Orange Co. (HBa, GMcC, PU, RW). One (218-1980) 2 Dec 1980 (not 12 Dec as in LeValley and Evens 1981), Crescent City, Del Norte Co. (RAE). One (29-1982) 6 Dec 1980, Santa Clara River mouth, Ventura Co. (GG); one (also 29-1982) 13-18 Dec 1980, Pt. Mugu, Ventura Co. (RW), photos on file; and one (57-1981) 1 Jan-20 Apr 1981, King Harbor, Redondo Beach, Los Angeles Co. (JLD, KLG, GMcC, JO), photos on file; because of similarities in tail pattern, the Committee felt that these three sightings of first-winter birds likely pertained to the same individual.

THICK-BILLED MURRE (*Uria lomvia*). One (56-1981) 4 Oct 1981, ca. 5-6 miles west-northwest of Pt. Pinos, Monterey Co. (SCW); photos on file.

KITTLITZ'S MURRELET (*Brachyramphus brevirostris*). One juvenile (83-1978) found 16 Aug, died 17 Aug 1969, La Jolla, San Diego Co. (LCB, PD); photos of specimen (study skin 37215, San Diego Natural History Museum) on file. This specimen was originally identified as a Marbled Murrelet (*B. marmoratus*) and so published by McCaskie (1970c). It was later reidentified and published by Devillers (1972) as the first described example of the juvenal plumage of Kittlitz's Murrelet known to science. When first submitted to the Committee (as *brevirostris*) it was judged unacceptable, origin questionable (Luther et al. 1979). Later it was relegated

to the now defunct "unresolved category" of the state list (Jones et al. 1981) upon a new vote of the Committee. After submission of new information, it was recirculated and accepted (9-1), thus adding the species to the state list.

BLACK-BILLED CUCKOO (*Coccyzus erythropthalmus*). One (235-1980) 24 Sep 1974, Pt. Mugu State Park, Ventura Co. (LJ); this was the first record for southern California. One immature (174-1980) 8-14 Sep 1980, Point Reyes, Marin Co. (LCB, JLD, RAE, JL, JSL, GMcC, DR); photos on file. One immature (76-1981) 12-13 Sep 1981, Brock Ranch, Imperial Co. (GMcC, JO); photos on file.

BARRED OWL (*Strix varia*). One (26-1982) 12 Mar 1982 to at least 5 Mar 1983, 3 miles east of Crescent City, Del Norte Co. (RAE, GSL, GMcC, JM, DR). This is the first record for California, extending the range of this largely sedentary but expanding species southward from Oregon.

BROAD-BILLED HUMMINGBIRD (*Cynanthus latirostris*). One adult male, 30 Nov 1980-14 Jan 1981 (240-1980) and 13 Dec 1980 plus 20-21 Nov 1981 (241-1980) and 18 Dec 1982-5 Jan 1983, Balboa Park, San Diego, San Diego Co. (GMcC); the Committee agreed that the above sightings, as well as those 28 Nov 1979-29 Feb 1980 (accepted under number 43-1980 in the Committee's sixth report, Binford 1983), pertain to the same individual; numbers 240-1980 and 241-1980 were published by McCaskie (1981b) as two separate individuals, the latter with the incorrect discovery date of 14 Dec 1980 instead of 13 Dec 1980. One adult male (7-1982) 4 Oct 1981-13 Feb 1982, Blythe, Riverside Co. (JLD, RW); photo on file. One female (82-1981) 8-9 Oct 1981, Tijuana River Valley, San Diego Co. (LJ, GMcC).

RED-HEADED WOODPECKER (*Melanerpes erythrocephalus*). One adult (11-1981) 17 Jul-22 Aug 1971, near Niland, Imperial Co. (EAC, SC, ATD, GMcC); photos on file. This is the only acceptable record for the state; see Cardiff and Driscoll (1972) for further details.

*LEAST FLYCATCHER (*Empidonax minimus*). One (134-1980) 28 Oct 1974, Furnace Creek Ranch, Inyo Co. (JLD, GMcC). One (135-1980) 28 Oct-24 Nov 1974, Emigrant Ranger Station, Inyo Co. (JLD, GMcC).

DUSKY-CAPPED FLYCATCHER (*Myiarchus tuberculifer*). One (190-1980) 7 Dec 1980-24 Jan 1981, Santa Cruz, Santa Cruz Co. (LCB, TB, RAE, AG, DJ, AM, EM, DR); photos on file.

A total lack of rufous in the tail is often said to be a character of this species. That this is not always the case is well illustrated by this bird, in which the outer webs of all the rectrices except the outermost pair (edged whitish) were narrowly but conspicuously edged with rusty above.

GREAT CRESTED FLYCATCHER (*Myiarchus crinitus*). One (89-1981) 30 Oct-1 Nov 1981, Long Beach, Los Angeles Co. (BED, KLG, GMcC, JO, RW); photos on file. This is the latest record for the state; all California records are for fall.

SCISSOR-TAILED FLYCATCHER (*Tyrannus forficatus*). One (17-1981) 27 Jul 1980, Bodega Bay, Sonoma Co. (LCB, BDP).

EURASIAN SKYLARK (*Alauda arvensis*). One (93-1981) 20 Dec 1981 (and see below), Point Reyes, Marin Co. (GMcC). The Committee believes this to be the same individual present at this locality each winter since 16 Dec 1978 and previously accepted in the Committee's fourth report (Luther 1980) under number 4-1979. Dates published in Committee reports and *American Birds* are as follows: 16 Dec 1978-19 Feb 1979; 27 Oct-1 Nov 1979; 25 Oct 1980-21 Feb 1981; 3 Nov 1981-3 Jan 1982; 31 Oct 1982-29 Jan 1983. See Morlan and Erickson (1983) for details.

BLUE JAY (*Cyanocitta cristata*). One (182-1980) 30 Oct 1963 (not 31 Oct as in McCaskie and Pugh 1964)-20 Apr 1964, Igos (not Iglos as in Roberson 1980), San Bernardino Co. (GMcC). This was the second record for the state; see McCaskie (1970b) for further details.

WOOD THRUSH (*Hylocichla mustelina*). One (86-1981) 24 Oct-6 Nov 1981 (not 5 Nov as in McCaskie 1982a), Point Loma, San Diego Co. (JLD, GMcC); photo on file.

GRAY CATBIRD (*Dumetella carolinensis*). One (192-1980) 5-6 Oct 1979, Point Reyes, Marin Co. (CH, LH); photo on file.

CURVE-BILLED THRASHER (*Toxostoma curvirostre*). One (166-1980) 20 Dec 1979-4 Feb 1980, near New River mouth, south end of Salton Sea, Imperial Co. (GMcC).

BLACK-BACKED WAGTAIL (*Motacilla lugens*). One adult female (55-1979) 7 Aug-22 Sep 1979 and 20 Jul-21 Sep 1980, Watsonville, Santa Cruz Co. (also seen across river in Monterey Co.) (SA, JLD, RAE, CF, AG, KLG, GMcC, JM, BDP, DR); photos on file. One adult male (70-1980) 22 May 1980, Tiburon, Marin Co. (WHL, SS); photo on file.

Record 55-1979, as well as the three records listed below under White/Black-backed Wagtail, were accepted in previous Committee reports (130-1978 and 55-1979, Luther et al. 1983; 104-1972, Winter 1973; 169-1977, Luther 1980) as "White Wagtail, *Motacilla alba*." Reevaluation by the Committee was occasioned by the recent separation (AOU 1983) of that form into two distinct species, the White Wagtail (*M. alba*) and the Black-backed Wagtail (*M. lugens*). The Committee voted to accept the conclusions of Morlan (1981) that records 55-1979 and 70-1980 definitely pertain to *M. lugens*, while the other three could not be allocated to species, partly because field marks for immatures have not yet been worked out. All three unidentified birds were accepted as White/Black-backed Wagtails. Thus the Black-backed Wagtail (*M. lugens*) should be added to the California state list and the White Wagtail (*M. alba*) deleted.

WHITE/BLACK-BACKED WAGTAIL (*Motacilla alba/M. lugens*). One (104-1972) 18-20 Oct 1972 (not 18-29 Oct as in Roberson 1980), Santa Clara River mouth, Ventura Co. (RD, REP, VP). One immature (169-1977) 10 Oct 1974, Southeast Farallon Island, San Francisco Co. (PH); photos on file. One immature (130-1978) 9-11 Oct 1978, Goleta, Santa Barbara Co. (LRBe, JLD, KLG, PL, GMcC, DR); photo on file; published by McCaskie (1979) as "apparently *M. a. ocularis*." See discussion under Black-backed Wagtail above.

RED-THROATED PIPIT (*Anthus cervinus*). One (111-1980) 12 Oct 1978, Goleta, Santa Barbara Co. (LRBe, PL). One (112-1980) 17 Oct 1978, near Santa Maria, Santa Barbara Co. (RW). One (114-1980) 11 Oct 1979, Goleta, Santa Barbara Co. (PL). One (215-1980) 24 Sep 1980, Goleta, Santa Barbara Co. (PL). Two (216-1980) 18-31 Oct 1980, near Santa Maria, Santa Barbara Co. (PL); the observer now prefers to count only two birds rather than "up to three" as reported to and published by McCaskie (1981a). One adult (3-1982) 9-11 Sep 1981, Goleta, Santa Barbara Co. (JLD, PL, JHM). Two (84-1980) 10-25 Oct 1981, Tijuana River Valley, San Diego Co. (GMcC). One (87-1981) 25-28 Oct 1981, Point Loma, San Diego Co. (JLD, GMcC, JO, RW); photos on file; see Figure 1. One (9-1982) 1 Nov 1981, Goleta, Santa Barbara Co. (PL).

SPRAGUE'S PIPIT (*Anthus spragueii*). Two (140-1980) 19 Dec 1975, Mission Bay, San Diego Co. (JLD). One (33-1981) 27 Oct 1978, Santa Clara River mouth, Ventura Co. (RW). One (193-1980) 1-2 Oct 1979, Southeast Farallon Island, San Francisco Co. (PH, PW); this is the first record for northern California. Up to five (8-1982) 22 Nov 1981-7 Mar 1982, near Lancaster, Los Angeles Co. (JLD, RAE, GMcC,

KLG, RW); photos on file; this is the first wintering record for California. One (6-1982) 27 Nov 1981, near Needles, San Bernardino Co. (JLD, KLG).

WHITE-EYED VIREO (*Vireo griseus*). One banded (178-1980) 4-5 Jun 1969, Southeast Farallon Island, San Francisco Co. (HR); photos on file; this was the first record for California. One (20-1981) 9 May 1981, Whitewater Canyon, near Cabazon, Riverside Co. (LJ). One (39-1981) 24-27 May 1981, Malibu Lagoon, Los Angeles Co. (JLD, KLG).

YELLOW-THROATED VIREO (*Vireo flavifrons*). One (41-1981 and 19-1982; accidentally circulated twice) 16-17 May 1981, Long Beach, Los Angeles Co. (JLD, KLG). One (61-1981) 22 May 1981, Deep Springs College, Inyo Co. (GMcC, DR).

PHILADELPHIA VIREO (*Vireo philadelphicus*). One (194-1980) 24 Sep 1979, Moss Beach, San Mateo Co. (PJM). One (224-1980) 14 Sep 1980, Watsonville, Santa Cruz Co. (JLD, RAE). One (4-1981) 18 Sep 1980, Point Reyes, Marin Co. (RS). One (201-1980) 19-25 Oct 1980, Deep Springs College, Inyo Co. (JLD, GMcC). One (226-1980) 26 Oct 1980, Pacific Grove, Monterey Co. (DR). One (227-1980) 28 Oct 1980, Bolinas Lagoon, Marin Co. (DS, RS); photo on file. One (62-1981) 23-26 May 1981, Oasis, Mono Co. (GMcC). One (63-1981) 25-26 May 1981, Oasis, Mono Co. (GMcC). One (68-1981) 29-30 May 1981, Oasis, Mono Co. (GMcC).

*RED-EYED (YELLOW-GREEN) VIREO (*Vireo olivaceus flavoviridis*). One (116-1980) 8 Sep 1979, Gaviota State Beach, Santa Barbara Co. (LRB). One banded (5-1981) 30 Oct 1980, Southeast Farallon Island, San Francisco Co. (BBo); photos on file; this is the second record of this race for northern California and first for the island.

GOLDEN-WINGED WARBLER (*Vermivora chrysoptera*). One male (196-1980) 8-15 Oct 1979, Fairhaven, near Arcata, Humboldt Co. (RL). One (26-1981) 10-11 Sep 1980, Moss Beach, San Mateo Co. (AG, JM); photos on file. One male (64-1981) 25-26 May 1981, Oasis, Mono Co. (GMcC). One (85-1981) 24 Oct 1981, Morongo Valley, San Bernardino Co. (GMcC, RW).

YELLOW-THROATED WARBLER (*Dendroica dominica*). One (60-1981) 25-26 Apr 1981, Point Loma, San Diego Co. (GMcC). One (37-1981) 11 May-20 Sep 1981, Santa Barbara, Santa Barbara Co. (JLD, PL). One male (20-1982) 27 May 1981, Zuma Canyon, west of Malibu, Los Angeles Co. (KLG). One (70-1981) 5-8 Sep 1981, Oasis, Mono Co. (JHM, GMcC); photos on file. One (78-1981) 24 Sep 1981, Point Loma, San Diego Co. (GMcC).

Number 37-1981 ". . . was believed to be a female . . . and carried on the now famous 'association' with a male Northern Parula [*Parula americana*] which summered at the same location and with which it cavorted. Although the Parula would seemingly display to the Yellow-throated on repeated occasions during the late spring and early summer, no evidence of nesting was ever found. Alas, no Sutton's Warblers were produced" (PL in CBRC files).

GRACE'S WARBLER (*Dendroica graciae*). One (183-1980) 16-17 Sep 1980, Tijuana River Valley, San Diego Co. (GMcC). One (83-1981) 10 Oct 1981, Point Loma, San Diego Co. (GMcC).

PINE WARBLER (*Dendroica pinus*). One (120-1980) 15 Oct 1979, Gaviota State Beach, Santa Barbara Co. (LRBe, PL).

PROTHONOTARY WARBLER (*Protonotaria citrea*). One immature male specimen (12-1981) captured and banded on 5 Sep, recaptured and held on 6 Sep and died 7 Sep 1970, Deep Springs College, Inyo Co. (MSM); photo on file; study skin 37621 in San Diego Natural History Museum; see San Miguel (1971) for further details. One (195-1980) 3 Nov 1979, Año Nuevo State Reserve, San Mateo Co. (PJO). One

(184-1980) 16-21 Sep 1980, Tijuana River Valley, San Diego Co. (JLD, GMcC). One (27-1981) 17-21 Sep 1980 (not 18-19 Sep as in Evens and LeValley 1981), Rodeo Lagoon, Marin Co. (JE, AG, JM); photo on file; see Figure 2. One (28-1981) 20-23 Oct 1980, Golden Gate Park, San Francisco Co. (AG, JM); photo on file. One (67-1981) 28-29 May 1981, Oasis, Mono Co. (GMcC, JO); photo on file.

WORM-EATING WARBLER (*Helmitheros vermivorus*). One (14-1982) 20 Sep 1981, Topanga, Los Angeles Co. (KLG, LJ). One (81-1981) 4 Oct 1981, Point Loma, San Diego Co. (GMcC). One (5-1982) 5 Nov 1981 (not 6 Nov as in McCaskie 1982a)-21 Mar 1982 and 1-5 Nov 1982, Whaley Park, Long Beach, Los Angeles Co. (BED, JLD, GMcC); this is the second wintering record for southern California and third for the state.

KENTUCKY WARBLER (*Oporornis formosus*). One female killed against window (217-1980) 14 Oct 1980, Goleta, Santa Barbara Co. (PL); photo of specimen (Santa Barbara Museum of Natural History) on file. One singing male (38-1981) 17-21 May 1981, Morongo Valley, San Bernardino Co. (JLD, GMcC, JO, RW); photos on file.

CONNECTICUT WARBLER (*Oporornis agilis*). One (186-1980) 19 Sep 1974 (not 29 Sep as in Roberson 1980), Tijuana River Valley, San Diego Co. (GMcC). One (9-1981) 19 Sep 1980, Southeast Farallon Island, San Francisco Co. (BP); photo on file. Up to two (213-1980) 4-12 Oct 1980, Point Loma, San Diego Co. (JLD, GMcC, JO); photo on file.

MOURNING WARBLER (*Oporornis philadelphia*). One (26-1980) 2 Sep 1979, Point Mugu, Ventura Co. (RW). One banded (198-1980) 23 Sep 1979, Southeast Farallon

Figure 1. Red-throated Pipit, 25 Oct 1981, Point Loma, San Diego Co., CA. See record 87-1981 under Accepted Records.

Photo by Richard E. Webster

Island, San Francisco Co. (PH, DS); photos on file. One female (199-1980) 30 Jun (banded)-1 Jul 1980, Southeast Farallon Island, San Francisco Co. (BBo). One (214-1980) 20-23 Sep 1980, Carpinteria, Santa Barbara Co. (LRBe, JLD, PL). One (54-1981) 29-31 Aug 1981, Carmel River mouth, Monterey Co. (RLB, JAG, JM, DR); photos on file. One (71-1981) 6-7 Sep 1981, Carpinteria, Santa Barbara Co. (JLD, GMcC, RW). One (49-1981) 7-12 Sep 1981, Point Reyes, Marin Co. (LCB, EM, JM, BDP, BY, CY). One (12-1982) 17 Sep 1981, Refugio State Beach, Santa Barbara Co. (PL). One (18-1982) 26 Dec 1981-28 Jan 1982, Harbor Lake, Long Beach, Los Angeles Co. (JLD, GMcC, RW); this is the first winter record for California.

SCARLET TANAGER (*Piranga olivacea*). One (121-1976) 2 Nov 1975, Panamint Springs, Inyo Co. (BB, HB, HC). One male (173-1980) 29-30 Jun 1980, Arcata, Humboldt Co. (PFS). One male (243-1980) 22 Sep 1980, Carpinteria, Santa Barbara Co. (LRBe). One male (29-1981) 25 May 1981, Deep Springs College, Inyo Co. (BB). One male (90-1981) 7-8 Nov 1981, Tijuana River Valley, San Diego Co. (GMcC). One female (4-1982) 17-18 Nov 1981, Goleta, Santa Barbara Co. (JLD, PL).

PAINTED BUNTING (*Passerina ciris*). One banded (200-1980) 28 Sep 1979, Southeast Farallon Island, San Francisco Co. (PH, DS).

CASSIN'S SPARROW (*Aimophila cassinii*). One (69-1980) 2 May 1978, Whitewater River mouth, north end of Salton Sea, Riverside Co. (JLD).

BAIRD'S SPARROW (*Ammodramus bairdii*). One (53-1981) 5-10 Oct 1981, Point Loma, San Diego Co. (JLD, RAE, GMcC, JO, DR, RW); photo on file. This is the second record for the state and first for southern California.

Figure 2. Prothonotary Warbler, 18 Sep 1980, Rodeo Lagoon, Marin Co., CA. See record 27-1981 under Accepted Records.

Photo by Albert Ghiorso

LE CONTE'S SPARROW (*Ammodramus leconteii*). One (66-1981) 24-25 May 1981, Furnace Creek Ranch, Inyo Co. (GMcC).

SHARP-TAILED SPARROW (*Ammodramus caudacutus*). One on 10 Oct, two on 25 Oct, three on 5-20 Nov 1980 (one banded on latter date), with two remaining to 20 Jan 1981 (222-1980), Bolinas Lagoon, Marin Co. (GMcC, RS); photos on file. Three (242-1980) 22 Nov 1980-7 Jan 1981, Tijuana River mouth, San Diego Co. (GMcC).

COMMON GRACKLE (*Quiscalus quiscula*). One (187-1980 7-8 Nov 1980, near Fort Dick, Del Norte Co. (GSL, RT).

*(BLACK) ROSY FINCH (*Leucosticte arctoa atrata*). One (170-1980) 31 Mar 1980, Conway Summit, Mono Co. (GMcC).

UNACCEPTED RECORDS, identification questionable

*LAYSAN ALBATROSS (*Diomedea immutabilis*). One (23-1981) 29 Nov 1973, seen from shore off Point Joe, Monterey Co.

CAPE PETREL (*Daption capense*). One (54-1976) 9 Sep 1962, Monterey Bay off Monterey, Monterey Co. (see McCaskie 1970a for details).

This record, in Committee since 1 February 1977 and circulated numerous times, was judged unacceptable by a final vote of 5-5 (9 affirmative needed to pass). The complete file numbers 81 pages! All recent published references to the occurrence of this species in California (e.g., McCaskie *et* al. 1979) are based on this record. Some authors question the origin of all Northern Hemisphere records (AOU 1983).

AMERICAN SWALLOW-TAILED KITE (*Elanoides forficatus*). One (30-1979) 7 Sep 1972, La Mesa, San Diego Co.

WILSON'S PLOVER (*Charadrius wilsonia*). One (7-1981) 21-23 Jan 1981, Elkhorn Slough, Monterey Co.

PIPING PLOVER (*Charadrius melodus*). One (15-1982) 9 Oct 1981, Moss Landing, Monterey Co.

*RUFF (*Philomachus pugnax*). One (79-1979) 21 Sep-8 Oct 1979, Arcata, Humboldt Co. This record was accepted by Laymon and Shuford (1980a).

GREAT BLACK-BACKED GULL (*Larus marinus*). One (175-1980) 11 Aug 1977, Upper Newport Bay, Orange Co.

This record was supported by only a color print (Figure 3), without written information other than date, locality and observer. The picture was scrutinized by the Committee and by several gull experts from the United States and England. Most said that single photographs, especially prints (as opposed to transparencies) are very difficult to evaluate—one cannot be sure that what is rendered in the photo is really the way the bird looked. Although at first glance this bird seems large and black-backed, the apparent size may be an artifact of posture (stretched neck, standing on tip toes), angle, and juxtaposition to nearby gulls. The dark back may be accentuated by the end-on view of the feathers and the film type and exposure. Dissenters pointed out the slenderness of the bill (very long but shallow, without a strong gonydeal angle), the nature of the black at the bill tip (large and solid rather than variegated with pale), the apparent slenderness of the body (despite its seeming height), and the inability to determine the pattern of white in the primaries. Some analysts felt that Slaty-backed Gull (*L. schistisagus*) and Yellow-legged Gull (*L. livens*) were not eliminated, and two thought the bird to be the southern race of Western Gull (*L. occidentalis wymani*). In any event, the case for the only West Coast record of Great Black-backed Gull was not proven, and the record was finally judged unacceptable, 1-9.

UNACCEPTED RECORDS, identification questionable

Observers should note that a photo often is not enough; it should be supported by a detailed description, one that includes a discussion of which parts of the photo were as depicted and which were not. This record was published by Roberson (1980) and Garrett and Dunn (1981).

THREE-TOED WOODPECKER (*Picoides tridactylus*). One (234-1980) 29 Apr 1979, Castle Lake, near Mount Shasta, Siskiyou Co. This record was published by Roberson (1980).

ACADIAN FLYCATCHER (*Empidonax virescens*). One (233-1980) 27 Sep 1980, Point Loma, San Diego Co.

This record was originally accepted by the Committee and formed the sole basis for inclusion of *E. virescens* on the California state list (Jones et al. 1981). It was published as a possible Acadian by McCaskie (1981a) and Roberson (1980). However, after receiving new information on Acadian identification from J. Van Remsen, the observers retracted the record. At its meeting of 18 February 1984, the Committee decided that records could not be retracted during circulation (see introduction) and voted unanimously to reject this record, thus deleting the species from the state list.

Remsen (in litt. to GMcC) notes that contrary to the submitted descriptions, Acadians collected from August through October, regardless of age, have buffy-ochraceous,

Figure 3. Unknown species of gull (far left), 11 Aug 1977, Upper Newport Bay, Orange Co., CA. See Great Black-backed Gull (record 175-1980) in Unaccepted Records, identification questionable.

Photo by Oliver Tostain

UNACCEPTED RECORDS, identification questionable

not white wingbars (56 of 56 specimens); yellow or yellowish-white, not white eyerings (52 of 54 specimens); a dingy grayish or yellow-tinged throat (43 of 56 specimens); and a totally pale lower mandible.

GREAT CRESTED FLYCATCHER (*Myiarchus crinitus*). One (13-1982) 20 Oct 1981, Goleta, Santa Barbara Co.

The Committee agreed (1-9) that Ash-throated Flycatcher (*M. cinerascens*) could not be eliminated. The Goleta bird was said to have the "belly and flanks *bright yellow*, shading abruptly to a *strong gray* at midbreast and above to throat and sides of face." While this sounds good, it is necessary to state clearly exactly how dark the gray was and how rich the yellow, comparing these terms to some other species or to specific color names; an Ash-throated in fresh fall plumage can be quite "bright" yellow and "strong" gray depending on one's interpretation of these terms. The observer did describe the heavier bill and the longer and more robust body. Committee members noted that the late evening light might have accentuated the belly and breast colors and that size is difficult for anyone to judge without direct comparison. Owing to the poor light and the uncooperativeness of the bird, two marks critical to the identification of this species could not be seen: the orangish base to the lower mandible and the olive-green (not brownish or grayish) back and crown.

VEERY (*Catharus fuscescens*). One (19-1981) 10 May 1981, Hwy. 104, Placerville to Ione, just south of Meiss Road.

CURVE-BILLED THRASHER (*Toxostoma curvirostre*). One (32-1980) 5 Oct 1979, Santa Clara River mouth, Ventura Co.

SPRAGUE'S PIPIT (*Anthus spragueii*). One (6-1981) 14 Dec 1980, Sacramento National Wildlife Refuge, Glenn Co.

PHILADELPHIA VIREO (*Vireo philadelphicus*). One (48-1981) 30 Aug 1981, near Auburn, Placer Co. One (50-1979) 14 May 1978, Scotty's Castle, Inyo Co.; published by McCaskie (1978), Roberson (1980) and Garrett and Dunn (1981).

Committee members pointed out that the dark loral line of the Philadelphia is not always as prominent as usually depicted in field guides. This line is not black but dark gray and sometimes is incomplete, while some Warbling Vireos (*V. gilvus*) give at least an impression of darkish lores. Possibly useful are the clean-cut look of the loral line (as contrasted with the smudgy appearance in darker-lored Warblings) and the darker post-ocular stripe, but these need further study. Warbling Vireos can have much brighter and more extensive yellow on the underparts than depicted in many field guides, especially in fall. For this reason, several Committee members believe that the color of the throat proper must be seen and described, the Philadelphia always having a yellowish throat (sometimes pale yellow; the chin may be whitish) and the Warbling a white throat (sometimes off-white).

WORM-EATING WARBLER (*Helmitheros vermivorus*). One (10-1982) 1 Nov 1981, near Figueroa Mt., Santa Barbara Co.; accepted by McCaskie (1982a).

CONNECTICUT WARBLER (*Oporornis agilis*). One (12-1980) 31 May 1974, Santa Barbara Island.

This record was accepted by McCaskie (1974), Roberson (1980) and Garrett and Dunn (1981). However, the reporter rejected his own record after learning more about *Oporornis* identification. He and most members felt that Mourning Warbler was not eliminated and in fact was indicated. Connecticuts rarely hop; they walk, rather deliberately. Compared to Mourning, the tail appears shorter because of the bulkier body and longer undertail coverts. The eyering probably is never widely broken (but see the narrow break in the eyering in the photo in Luther 1980).

UNACCEPTED RECORDS, identification questionable

OLIVE WARBLER (*Peucedramus taeniatus*). One (92-1981) 16 Oct 1979, Southeast Farallon Island, San Francisco Co.

This record was originally submitted as a Pine Warbler and was published as such by Laymon and Shuford (1980a). However, before it could receive final Committee validation, it was retracted and resubmitted as an Olive Warbler, a species unrecorded in California. The Committee was confident that it was not an Olive Warbler, voting 0-10 on the first round. Members pointed out that contrary to the description, an Olive Warbler has yellowish extending broadly above (as well as behind and below) the dark cheek patch; has a mellow whistled "kew" call, not a "chip"; lacks streaks on the sides of the breast and flanks, a faint malar stripe, and an incomplete white eyering; and (fide KLG) flicks its wings kinglet-like.

UNACCEPTED RECORDS, origin questionable (identification accepted)

ANHINGA (*Anhinga anhinga*). One (2-1979) 2 Jun-16 Jul 1939 (not 2-29 Jun as in Roberson 1980), Lake Merced, San Francisco Co.; see Bolander (1939) for further details. Note: the identity of a bird at Searsville Lake, San Mateo Co., 28 and 30 May 1939, reported as an Anhinga and said to be "undoubtedly the same bird" as at Lake Merced, has been questioned by Sibley (1952); the Committee did not deal with this sighting.

This species, as well as the Ruddy Ground-Dove, Gray Silky-flycatcher and White-collared Seedeater (see beyond), are not on the California state list. They are not known to occur regularly any closer to the state than Sinaloa, Mexico, although the last three have been recorded as presumed escapees at intervening localities, and there is one apparently valid record of the Anhinga for Arizona (Phillips and Monson 1981). The wandering habits of the Anhinga and Gray Silky-flycatcher perhaps make them candidates for vagrancy; the latter, however, is known to be a cage bird in at least southern Mexico (LCB, pers. obs.) The western races of the ground-dove and seedeater are thought to be largely sedentary.

California records of Mexican species are difficult to assess because we do not know how many such birds are imported illegally, released by returning American tourists or immigrant Mexicans, or lost from U.S. zoos or from pet shops, especially those near the border in Mexico (e.g., Tijuana). In such cases the Committee prefers to await the development of a clear pattern of vagrancy in regions between California and the normal range. Rejected records remain in the CBRC files and may be resubmitted should a pattern be detected. Observers should report to the Committee all possible escapees—if they are also possible wild birds. Only then can a pattern be discerned.

AMERICAN BLACK DUCK (*Anas rubripes*). One (149-1980) 11 Nov 1978, Niland Fish Hatchery, Imperial Co.

No California record for this species has yet been accepted by the CBRC. Because of the presumed frequency of escapes and releases, addition of this species to the state list may require the recovery of a wild bird banded in its normal range.

RUDDY GROUND-DOVE (*Columbina talpacoti*). One (31-1981) 24-26 Nov 1978, near Fillmore, Ventura Co. See comments under Anhinga.

GRAY SILKY-FLYCATCHER (*Ptilogonys cinereus*). One (115-1980) 9 Apr 1976, Ventura, Ventura Co. See comments under Anhinga.

WHITE-COLLARED SEEDEATER (*Sporophila torqueola*). One adult male (34-1981) 19 Sep 1977, Tijuana River Valley, San Diego Co. This bird was clearly from one of the west Mexican populations (*S.t. torqueola* or *S.t. atriceps*). See comments under Anhinga.

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ACKNOWLEDGMENTS

I gratefully acknowledge the help of the members of the California Bird Records Committee and of the *American Birds* regional editors, Jules Evens and Guy McCaskie, in reviewing this paper and providing valuable data. The Committee greatly appreciates the critical reviews of records by the following consultants: Harold H. Axtell, Davis Finch, Daniel D. Gibson, P.G. Grant, Kenn Kaufman, Ronald R. LeValley, Allan R. Phillips, J. Van Remsen and William Russell.

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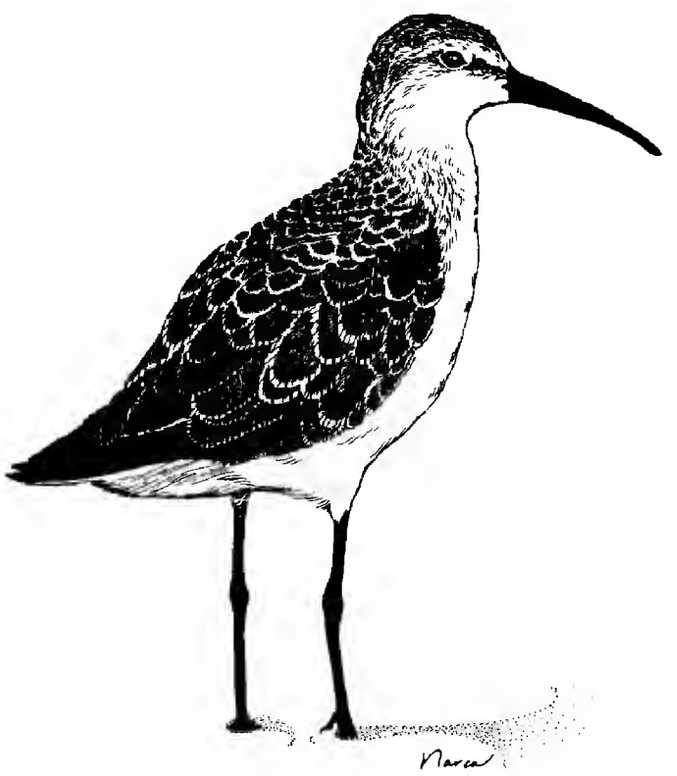
Accepted 24 May 1984



Juvenile Curlew Sandpiper *Sketch by Narca Moore-Craig*

NOTES

WEATHER-RELATED MORTALITY IN SWALLOWS IN THE SACRAMENTO VALLEY OF CALIFORNIA

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Heavy rains, cold temperatures and fog persisted throughout the winter and early spring of 1981-82 in the Sacramento Valley of California. Total rainfall in Chico, Butte County, California, for the period 1 March-15 April 1982 was 21.08 cm, 7.06 cm (50.4%) above normal for the entire months of March and April. Mean daily temperature during March was 11.1°C, a 0.2°C decrease from normal, and during April was 12.6°C, a decrease of 1.4°C (NOAA 1982a,b). During spring, 1982, we observed several incidents of mortality in swallows (Hirundinidae) which we believe were weather related.

On 24 April 1982 we observed over 100 dead swallows (Barn Swallow, *Hirundo rustica*; Cliff Swallow, *H. pyrrhonota*; Tree Swallow, *Tachycineta bicolor*; and Violet-green Swallow, *T. thalassina*) on the floors of two open-sided buildings at Gray Lodge Wildlife Area, Butte County, California. From the locations of the birds, it was apparent that they had fallen from perches at or near death. Most of the birds were in a deteriorated condition, but the few that could be examined were emaciated and thin. Swallows usually return to the Sacramento area in late February or early March (Gaines 1972); the 1982 migration was delayed for a few weeks, but we observed that most swallows had returned by mid-March. During the period 29 March-4 April, Chico received 8.33 cm of rain with 5.08 cm falling on 31 March alone. Mean low temperature for these seven days was 3.8 ± 1.6 (SD)°C, and mean high temperature was 10.4 ± 2.4°C. Mean low temperature recorded in Colusa, Colusa County, a nearby weather recording station, for this same period was 1.7 ± 1.8°C (NOAA 1982a,b). During this period we noted an absence of flying insects; apparently the birds had starved to death. There was no reason to suspect pesticide poisoning as the adverse weather delayed planting and spraying until late spring. Similar phenomena were observed in southern Germany and Switzerland where a freak autumn storm caused a reduction in the available insect prey and resulted in the death of hundreds of Barn Swallows and Common House-Martins (*Delichon urbica*) (Ruge 1974) and in North Carolina where several Purple Martins (*Progne subis*) died during a spring snowstorm (Stewart 1972).

We noted additional cases of weather-induced mortality in swallows during May 1982. Six Cliff Swallow nests were discovered with the tails and rumps of dead birds protruding from them. Three of the nests were located under a highway bridge along County Road 102 about 2 km north of Davis, Yolo County, California; two were located under the Interstate 80 bridge over Putah Creek southwest of Davis; and the remaining nest was located under the eaves of a building on the University of California campus in Davis. Two of the nests at the first location were collected and, upon examination, were found to contain the decomposed bodies of as many adult Cliff Swallows as the volume of the nests permitted, six in one and seven in the other. The arrangement of the bodies inside the nests suggested that the last bird to enter became

caught in the narrow opening of the nest when another bird tried to force its way out, thereby trapping the other birds inside.

Huddling has been reported in Purple Martins in martin houses in Texas during periods of prolonged cold weather (below 6°C) (Brown 1976). Chaplin (1982) has demonstrated that huddling behavior may be an effective means of reducing nocturnal metabolic rate in Bushtits (*Psaltriparus minimus*), with pairs huddled together reducing their individual metabolic costs by over 20%. Presumably, this mechanism has evolved to help small insectivorous species survive cold periods with diminished food supplies. It seems reasonable to suppose that the mass-deaths of swallows observed in the buildings at Gray Lodge Wildlife Area and in the nests around Davis were the result of a similar, but in these cases insufficient, behavioral adaptation.

We would like to thank Cameron Barrows, Charles Brown, Geoffrey Holroyd and Charles Van Riper III for reviewing previous drafts of this manuscript.

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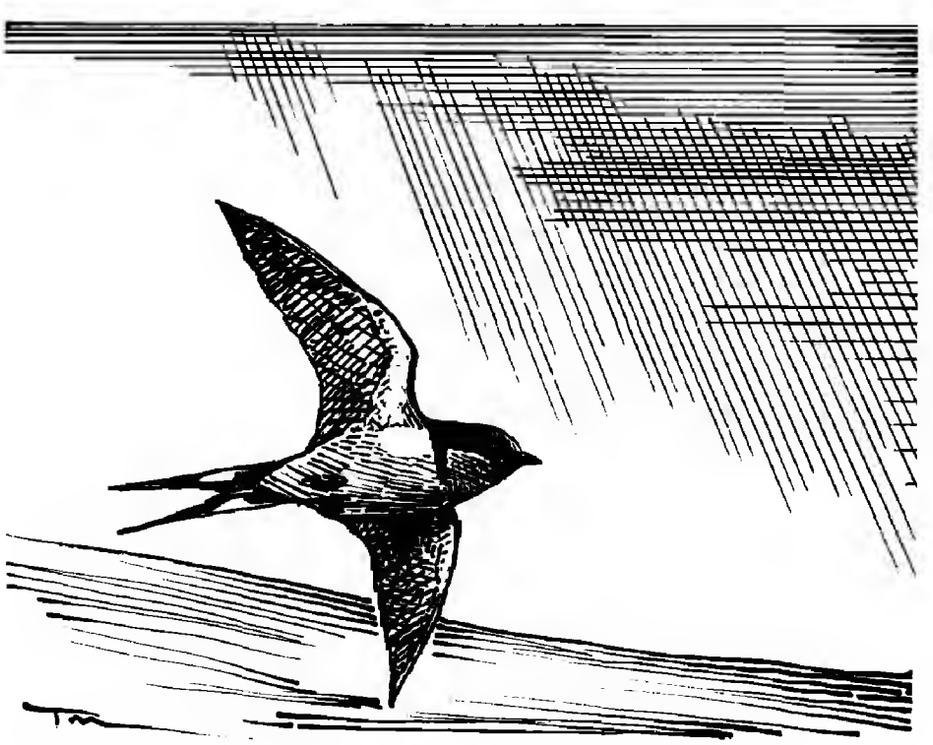
Accepted 27 August 1984



Barn Swallow *Sketch by Tim Manolis*

PREDATOR AVOIDANCE THROUGH BURROW USE BY CASSIN'S AND BLACK-THROATED SPARROWS

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Arid grassland birds are difficult to observe and follow in the field. Often it appears that a bird "must have disappeared down a hole somewhere." Here we report observations showing that this behavior actually occurs. Grassland birds in southeastern Arizona occasionally enter rodent burrows to escape predation.

In 1982 and 1983 we banded and color-marked a population of Cassin's Sparrows (*Aimophila cassinii*) southeast of Tucson, Pima Co., Arizona, as part of a study to determine this species' seasonal movements. On 18 February 1983 we recaptured an adult male originally banded on 29 October 1982 in the same location. During handling the bird was injured and momentarily escaped. The sparrow ran across bare ground to the nearest shrub, a Creosotebush (*Larrea tridentata*), and disappeared into a rodent burrow under the bush. The burrow ran along the surface approximately 3 cm beneath the ground, so we dug along the length and found the bird approximately 45 cm into the burrow. The bird escaped again and reentered the excavated burrow and was recaptured at the same spot. The bird was collected due to its injury: the specimen is now in the University of Arizona collection (UA 14422).

Bowers had previously observed Cassin's Sparrows entering burrows during this study on 3 November and 4 December 1982. In both instances the birds were being chased by Bowers in an attempt to drive them into mist nets. On 3 February 1983 at the Santa Rita Experimental Range, 48 km south of Tucson, Pima Co., Arizona, an adult Black-throated Sparrow (*Amphispiza bilineata*) escaped while being removed from a mist net. The bird ran to the nearest bush and immediately entered a White-throated Woodrat (*Neotoma albigula*) midden. The bird did not reappear in spite of attempts to scare it out of hiding.

Occasional use of burrows has been reported for Brown Towhees (*Pipilo fuscus*) and Black-throated Sparrows (Austin and Smith, Auk 91:167, 1974) as a mechanism for escaping summer heat. Our observations were taken during relatively mild conditions. Normally grassland birds react to a capture attempt by running to cover or by flying. The birds we observed had either just escaped from the hand, or were being pursued closely by one or more people. Thus these species may use rodent burrows as a "last-ditch" effort to escape predation.

We thank Stephen Russell for reviewing this note.

Accepted 27 September 1984

Black-throated Sparrow *Sketch by Tim Manolis*

Book Review

The Birds of San Diego County. Philip Unitt. 1984. Available from San Diego Natural History Museum Store, P.O. Box 1390, San Diego, CA 92112. xxii + 276 pp., 12 color plates, 12 black and white photographs, 126 distribution maps. Price: $14.00 for paperback, $20.00 for hardcover (California residents add 6% sales tax); please add $2.00 for postage/handling.

San Diego County, California, is certainly one of the most exciting counties for birds on the continent. Due to its strategic coastal location, varied habitats, and relatively long history of ornithological exploration, it presently boasts a list of over 450 species, highest of any county in North America. Climate, topography and soil type all vary significantly, resulting in such varied habitats as open ocean, rocky coast and sandy beaches, fresh- and salt-water marsh, grassland, chaparral, riparian and coniferous woodlands, and desert scrub. Many of these habitats have been much altered by an already large human population which continues to increase rapidly.

The ornithological exploration of the county began at a relatively early date for the Far West, with brief visits by naturalists as early as 1793 and more extensive collecting expeditions undertaken in the 1850s. Collections of specimens and eggs from the late 1800s and early 1900s provide valuable information on the nesting dates and former ranges of many species. Beginning in the 1960s, ornithology in San Diego Co. was turned in a new direction by the advancement of field identification techniques and the activities of several keen field observers whose interests in migrants and vagrants led them to "discover" some of the best birding hot spots in California (e.g. Pt. Loma and the Tijuana River Valley), as well as to add many new species to the county (and state) list.

Coming out of an appreciation for this area's rich and ever-changing birdlife is Philip Unitt's *The Birds of San Diego County,* published by the San Diego Society of Natural History. This book begins with a brief discussion of the county's ornithological history, as well as a description of the sources of information consulted and the taxonomy and nomenclature used. This section is followed by a nice overview of the geography and vegetation of the county. The accounts of major plant communities give information on characteristic or dominant plants and representative bird species found in each. Black-and-white photographs of the major communities are helpful in giving the reader a feel for the areas. The individual species accounts which follow make up the heart of the book and provide extensive information on the distribution, abundance, migration, nesting, and subspecific status (if relevant) for each species recorded in the county through 1981. Special detail is given to historical changes in status, arrival and departure dates, maximum counts of migrants and visitors, the duration of breeding seasons based on egg dates, citations of the literature or observer behind virtually all individually listed records, and the discussion of the status and distribution of all subspecies known to have occurred in the county. Outline maps of the county with symbols denoting definite vs. probable breeding based on published vs. unpublished records are valuable additions to the individual accounts of nesting species. The book concludes with a listing of the species with brief annotations denoting breeding status and method of documentation for their occurrence in the county, a thorough bibliography, and an index.

This book is certainly one of the most thorough works on the status and distribution of the birds in a region this size ever written. Unitt's treatment is not only excellent for a rich and diverse county such as San Diego, but also outshines the efforts of a good number of state and provincial publications. His coverage of breeding distributions, historical changes in status, and subspecies, as well as his extensive citations for individual records, are especially laudable. One only has to thumb through a small sample of species accounts to appreciate the detail found in this book. For species of special concern, such as the Least Tern, the amount of information is particularly im-

pressive. The author's excellent treatment of all subspecies recorded in San Diego County provides the reader with a greater understanding and appreciation of bird distribution and movement in this relatively complex region. While there are many examples of subspecies accounts which teach the reader much, one cannot help but be particularly impressed by the treatment of Orange-crowned Warbler, Fox Sparrow and Dark-eyed Junco. Also invaluable is the author's discussion of the identification and separation of most of the subspecies that have occurred in the county.

Overall, the production of the book is attractive. It is relatively free of typographical errors or lapses, one of the more serious being the omission of Black-throated Sparrow from the final "List of Species." *The Birds of San Diego County* contains twelve color plates from original watercolors by Allan Brooks. The quality of reproduction is average, and while many readers will find them appealing, this reviewer was not overly impressed and does not believe they add much to the quality of this type of book. One drawback in the production of this volume was the lengthy delay in publication. Unitt includes all records known to him through 1981, yet the book was not published until 1984. Even though the author partially compensates for this by including an addendum listing the most significant records occurring between January 1982 and December 1983, a fair amount of recent, valuable information is not included, resulting in the book's being a little more out-of-date than "need be."

While this book is very thorough in many regards (as discussed above), it should be pointed out that it does lack a number of important records. The main text (implied to be complete through 1981) is missing records of "Aleutian" Canada Goose (November 1981), Grace's Warbler (October 1981), Worm-eating Warbler (October 1981) and Hooded Warbler (additional individual in spring 1981). It appears from the acknowledgements that *no* active field observers reviewed the manuscript in its final form, a process which would certainly have resulted in improvements to a significant number of the species accounts. Such review would have refined a number of the early and late arrival dates, provided more realistic high counts for some species (e.g. Long-billed Dowitcher), and removed some of the few inaccuracies: for instance, the statement that the Kittlitz's Murrelet record is the only one south of Alaska is incorrect—there is also one from Washington.

Although such a book deals only with a limited geographical area, it is often helpful to mention briefly the status of a species in adjoining regions. This practice helps to explain patterns of records, highlight outstanding sightings, and point out "holes" in the data that need to be filled in. Unitt has added this information for a number of accounts (e.g. Marbled Murrelet), particularly for subspecies, yet more would have been helpful. Through 1981 no records were cited for over-summering Semipalmated Plover or Pomarine Jaeger (both have been recorded several times since 1981); a statement that there are a number of such records for adjoining regions would have put the lack of San Diego County records in better perspective.

The author certainly has the final say on the inclusion or rejection of any record. However, it would have helped many readers if Unitt had briefly described the nature of the more "controversial" ones. The existence of the California Bird Records Committee (CBRC) and its decisions are never mentioned anywhere in the book, even though the author was a former member of that committee. While he need not have followed that body's decisions in cases with which he disagreed, a discussion of the different views on particular records was in order. For example, the record of Anhinga is published with no mention of the debate surrounding the bird's possible origin or that the record has, to date, been rejected by the CBRC. Unitt includes a good section on "Species Erroneously or Inadequately Reported from San Diego County" in which he discusses previously published records which should be either questioned or dismissed. However, this section includes the San Diego record of Harcourt's Storm-Petrel with no mention of its being accepted by the CBRC, and a reference to a Cape Petrel record for California which has been rejected.

My biggest complaint with this book is the author's choice of taxonomy. The organization follows neither the 5th nor 6th editions of the AOU Check-list. Unitt explains that "I realize this unorthodox approach may be disconcerting to some readers, but I hope to compensate for this by sparking increased interest in the wondrous complexities of bird evolution." I disagree. This book deals with the status and distribution of the birds of a region, not the controversial field of taxonomy above the species level, and will be read primarily by amateur birders, field ornithologists, and environmentalists and government officials interested in making informed decisions regarding land use, conservation and development. These people can only be confused by the location of shrikes and vireos between the corvids and chickadees and by the cardueline finches' placement between the waxwings and warblers. Other examples include the locations of the loons, grebes and hawks, as well as the ordering within the shorebirds. The index will be an absolute necessity for most readers. Unitt largely adheres to the AOU's selection of English names, with one notable exception: his use of Painted "Whitestart" (= Painted Redstart).

In sum, Philip Unitt's *The Birds of San Diego County* is an excellent book, crammed with more information than one can find in many publications on entire states. The treatment of breeding distributions and egg dates, historical changes in range and status, and subspecies are especially fine. The presentations on the identification of many subspecies will be of great value to all. For those reasons, this book can be highly recommended not only to students of bird distribution and residents of the San Diego region, but to all field ornithologists and birders alike.

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DEDUCT WFO

At a recent meeting of the Board of Directors, held during the hiatus between the Brambling and the Little Curlew, Western Field Ornithologists established the "_____" Endowment Fund. Proceeds from investment of this fund will be used primarily to publish *Western Birds*. Currently the fund is empty, but our Treasurer assures me that, nevertheless, it is there—waiting . . . .If anyone out there feels the urge to be the first (or even the second) to fill this void, here's how.

LIFE MEMBERSHIPS. All monies from life memberships will be placed in the "_____" Endowment Fund, where they may be put to good use indefinitely. Were we to spend them now, they would pay for less than 17 years' worth of subscriptions, and both you and WFO plan to last much longer than that. Doubtless you are wondering what you get. *Western Birds*, of course; who could want more? But you do get more, something very important—peace of mind. No longer will you wonder if that issue lost in the mails was never sent because you failed to pay your dues. Also, if your pocketbook thins in future years, you can still read *Western Birds* while standing in the bread line. And, of course, you will have the smug luxury of chucking all dues notices into the circular file. Believe me, that feels good!

MEMORIAL FUNDS. Some of you may wish to establish a subfund in honor of a lost birding companion with whom you misspent your youth, or in honor of a relative who suffered many lonely days at home (reading *Western Birds*) while you went birding. Such a subfund could be named in that person's honor and receive donations so designated from anyone. Besides, names would look much nicer in our financial reports, and our Treasurer tends to get confused when he labels them by number.

BEQUESTS. All of you, of course, plan to live forever. I certainly do (although on Mondays I feel like I already have). This rarely happens. If it does, please let us know and we will compose a dandy lead article for *Western Birds*. But if it doesn't, what are you going to do with all those millions? After all, in the Hereafter, birding will be free. Allow me to suggest a bequest, preferably immodest, to be placed in the "_____" Endowment Fund and used in perpetuity to publish articles on your favorite subject—birds. What better way to live forever?

DONATIONS. Each of you, I feel certain, donates to one or several charities each year. Who hasn't had the Boss "suggest" a small paycheck deduction for the United Fund? Unfortunately, that organization, and so far all others, have not seen fit to recognize WFO as an important charity. But we do. This year, instead of merely *telling* the IRS you made the proper percentage of charitable gifts; why not really *do* it? I can safely say we are as non-profit as any 501 (c) (3) organization. Keep in mind, too, that the overall fund, the "_____" Endowment Fund, needs a name, if only so we will not have to keep referring to it as the " '_____' Endowment Fund." I suspect the Board would find a five-digit donation very persuasive in this regard. And don't feel embarrassed to suggest that your name be used—after all, why do you think all those civic buildings are named after people?

Even if you are not in a position to name the "_____" Endowment Fund, please make a donation, however small, for the birds, thumb your nose at the IRS, and deduct WFO.

LAURENCE C. BINFORD, President WFO, 985 Emily Avenue, Rohnert Park, California 94928

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AMERICAN ORNITHOLOGISTS' UNION MEETING

The AOU 103rd Stated Meeting will be held at Arizona State University in Tempe, Arizona, from 7-10 October 1985. All persons interested in the conservation and management of birds are encouraged to attend.

Call for papers to the membership will appear in April, with deadlines for program space being 15 June 1985 for the general scientific program. Non-AOU registration costs are the same as members' ($30 pre-1 August for nonstudents and $20 for students with copies of validated ID's; $40 post-1 August for non-students and $25 for students with copies of validated ID's).

A symposium on the biology and management of Bald Eagles is scheduled Monday, 7 October from 1300 to 1700, but if participation interest in the symposium continues the starting time will be 1000, with notification. Deadline for manuscripts is 15 June, 1985.

A symposium on avian olfaction will be held on Monday, 7 October from 1300 to 1700. There will be seven to eight half-hour presentations of original research.

A symposium on the importance of competition in structuring avian communities will be held Tuesday, 8 October, from 0900 to 1200. The program will consist of two overview papers (Drs. Thomas Schoener and John A. Wiens) and field studies.

General scientific paper sessions will begin at 1300 Tuesday, 8 October, and continue through Thursday, 10 October.

Workshops on use of visual aids in presenting scientific data, experimental methodologies and their use in scientific studies, and Bald Eagle color marking protocol will be held Monday, 7 October. Anyone desiring to present a workshop at these meetings, to register as a nonmember, or to obtain more information please contact: Dr. Robert D. Ohmart, Center for Environmental Studies, Arizona State University, Tempe, Arizona 85287.

NATURE SOUND SOCIETY FORMED

Under the sponsorship of the Oakland Museum Natural Sciences Department, the Nature Sound Society was formed in the fall of 1984 to bring together people interested in field recording and use of nature sounds. Members' diverse activities include field recording of birds, crickets, toads and pigs; research in animal communication; and the use of nature sounds in education and in the visual and performing arts. Amateur and professional recordists, educators and others will find NSS a focal point for exchange of information, workshops, a compilation of a registry of nature sounds, and a newsletter covering members' projects and pertinent articles. At present, there is a San Francisco-Oakland Bay Area Chapter and a newly formed Northwest Chapter. Dues are $4.00 annually. For information, write Paul Matzner, Chairman of NSS, at The Oakland Museum, One Thousand Oak St., Oakland, CA 94607, or Marie Mans, Northwest Chapter, P.O. Box 831, Trinidad, CA 95570.

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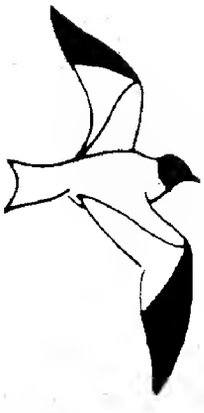
Cover photo by Janice Clark: Scrub Jay *(Aphelocoma coerulescens)*, Sacramento, California, May 1980.

Manuscripts should be sent to Alan M. Craig, P.O. Box 254, Lakeview, CA 92353. For matters of style consult *Suggestions to Contributors to Western Birds* (6 pp. mimeo available at no cost from the Editor) and *Council of Biology Editors Style Manual* 4th edition, 1978 (available from the American Institute of Biological Sciences, 1401 Wilson Boulevard, Arlington, VA 22209 for $12.00).

Papers are desired that are based upon field studies of birds, that are both understandable and useful to amateurs, and that make a significant contribution to scientific literature. Appropriate topics include distribution, migration, status, behavior, ecology, population dynamics, habitat requirements, the effects of pollution, the techniques for identifying, censusing, sound recording and photographing birds in the field. Papers of general interest will be considered regardless of their geographic origin, but particularly desired are papers dealing with studies accomplished in or bearing on Rocky Mountain states and provinces westward, including Alaska and Hawaii, adjacent portions of the Pacific Ocean and Mexico, and western Texas.

Reprints can be ordered at author's expense from the Editor when proof is returned or earlier.

Good photographs of rare and unusual birds, unaccompanied by an article but with caption including species, date, locality and other pertinent information, are wanted for publication in *Western Birds*. Submit photos and captions to Photo Editor.



WESTERN BIRDS

Vol. 16, No. 2, 1985

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Quarterly Journal of Western Field Ornithologists

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Published October 20, 1985

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WESTERN BIRDS

Volume 16, Number 2, 1985

FIRST NESTING RECORDS AND CURRENT STATUS OF THE BLACK-SHOULDERED KITE IN ARIZONA

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On 5 August 1983 Gatz and Jakle observed two pairs of Black-shouldered Kites (*Elanus caeruleus*) nesting in a row of Fremont Cottonwoods (*Populus fremontii*) along the Santa Cruz Wash channel on abandoned farmland 11 km south of Casa Grande in Pinal County, Arizona. Although this record is the first documented nesting attempt, previous nesting success in Arizona is evidenced by a juvenal-plumaged kite photographed (Figure 1) in a pecan orchard in Pima County near Pinal Air Park on 19 June 1982 (Seymour and John Levy pers. comm.) and by three fledged kites being fed by two adults in the same orchard near Pinal Air Park on 25 July 1983. A third area of likely nesting is near Elfrida, Cochise County, where two adult and two calling juvenal-plumaged kites were observed from September to November 1983 and where two adults and four immatures were seen from August to October 1984 (Arnold Moorhouse pers. comm.). The Elfrida birds were observed hunting over irrigated alfalfa fields and perching in dead cottonwoods in an area about 3 km from a pecan orchard. This report documents the first observed nesting attempt and summarizes Arizona records of this species.

One week before confirming the nesting attempt, Gatz and Jakle observed two kites mobbing an immature Red-tailed Hawk (*Buteo jamaicensis*). A search of the area defended by the kites revealed a partially constructed nest in the upper branches of a nearby 12 m high cottonwood. A complete kite nest which had probably blown down earlier in the year was on the ground below the nest tree. On 5 August Gatz and Jackle saw a pair of kites at the nest site; a second pair of kites was also nesting in a cottonwood 400 m north of the first nest site. Members of both pairs were gathering nesting material and building their nests. The male at the first nest site was gathering nesting material by perching in the lower portion of a live cottonwood tree and breaking off thin, dead branches with his beak. The first pair copulated three times within a 2.5 hour period. When Glinski and Monson visited the nesting location on 12 August, kites were incubating on both nests.

Both nests were blown down during a storm in mid-August, ending the nesting attempt. The first nest contained eggshell fragments; Glinski saw only three kites in the area at this time. On 30 September Gatz and Jakle found only one kite in the area: it did not visit the nest trees nor display any territorial behavior toward other raptors in the area during 1.5 hours of observation. Gatz saw no kites in this area on 8 November 1983. An adult kite was shot by a dove hunter in this area in September 1984. This is the first specimen for Arizona and it is deposited in the University of Arizona collection.

The Black-shouldered Kite is a newcomer to Arizona. The first sighting was of a single bird west of the Dragoon Mountains in Cochise County on 6 November 1972 (Monson 1973). As of September 1984 there have been over 60 sightings involving up to 105 individual kites from 42 different locations in 8 Arizona counties (Cochise, Graham, Maricopa, Pima, Pinal, Santa Cruz, Yavapai and Yuma). All but three of these kite sightings have occurred since 1978 (Figure 2) and all but three of the sightings were made in south-central and southeastern Arizona (Monson 1973; Ellis and Monson 1979; Rosenberg et al. 1980, 1981; Witzeman et al. 1980; Monson and Phillips 1981; Hubbard et al. 1982; Witzeman 1983a, 1983b; Janet Witzeman pers.

Figure 1. Juvenile Black-shouldered Kite (note streaked breast and dark band on tail). Pima County, Arizona, 19 June 1982.

Photo by John Levy

comm.). The three Arizona sightings not in the south-central or the southeastern part of the state were of single birds in southwestern Arizona on the Colorado River, Yuma County, in March and November 1980 (Rosenberg et al. 1980, 1981) and in March 1984 (Janet Witzeman pers. comm.).

Although Black-shouldered Kites have been observed in Arizona since 1972, indications of breeding in the state are quite recent. All sightings of kites in Arizona were of single birds until 5 June 1982 when three adults were seen near Pinal Air Park (Witzeman 1983a). Since then, up to five kites, including fledged young, have been observed during the summers of 1982 and 1983 near Pinal Air Park. These sightings were followed by the attempted nesting of the two pairs of kites near Casa Grande in August 1983 and by the fledged kites seen in the Elfrida area in 1983 and 1984 mentioned earlier in this paper. Four additional areas with evidence of nesting were reported in 1984. An active nest was found in oak savannah habitat in the outer crown of a 10 m tall Emory Oak (*Quercus emoryi*) 150 m from a residence near Sonoita, Santa Cruz County (Sidney Franklin pers. comm.). The site was visited by Monson and Jane Church on 15 June 1984, the day after five nestlings had fledged. Transfers of prey from adult to adult and from adult to young were observed. The prey appeared to be cotton rats (*Sigmodon* sp.). Three recently fledged kites and two adults were photographed between

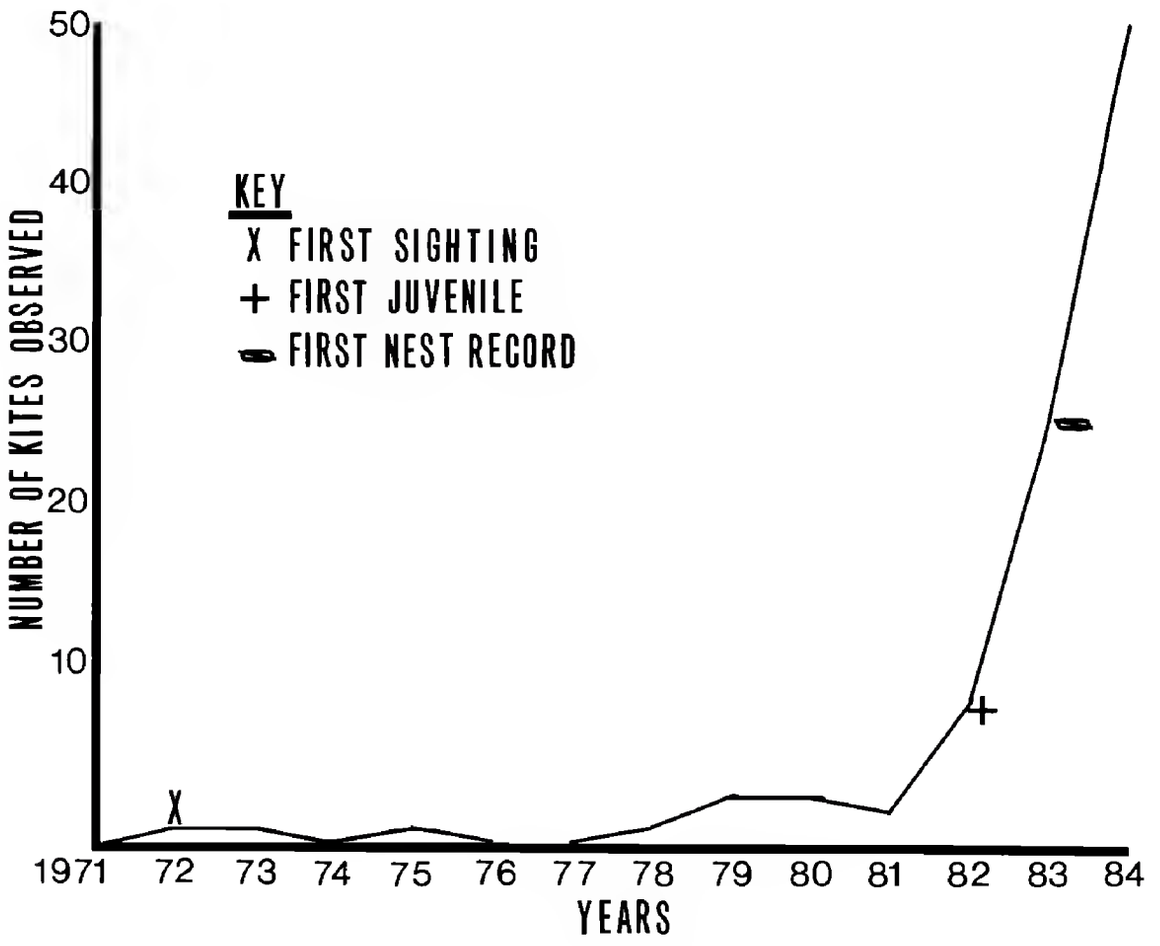

Figure 2. Number of Black-shouldered Kites observed annually in Arizona.

pecan groves near Green Valley, Pima County, in June 1984 (Don Garver pers. comm.). The young remained in the area into August; only the adults were seen in early September. A third probable nesting area was 5 km southeast of downtown Tucson, Pima County, where a recently fledged young and 2 adults were observed on 14 August (Rick Bowers pers. comm.). The fourth area was on the Buenos Aires Ranch near Sasabe, Pima County, where an immature bird was seen with adults in August 1984 (G. Scott Mills pers. comm.).

The increase of this species in Arizona follows its general population increase and range expansion in other parts of North and Middle America during the last 40 years. This increase is described in detail by Eisenmann (1971) and Pruett-Jones et al. (1980). This species is also expanding its range in Portugal, Europe. Sacarrao (1982) suggests that this increase in Portugal may be related to a rise in mean temperature, but he does not rule out intensification of agriculture and the subsequent increase in rodent populations as contributing factors. Kenn Kaufman and Scott Terrill (pers. comm.) suggest a northward expansion from Central America to explain the sudden appearance of this species in western Mexico in the 1970s and its subsequent invasion of Arizona in the 1980s. The reasons for this recent population increase and expansion are unknown but may be related in part to the increase in suitable foraging habitat created by irrigated agricultural lands (Krebs 1966), retired cropland (Waian 1976), and by grassland succession after brush and tree clearing operations (Webster 1974). In San Diego County, California, Dixon et al. (1957) noted that when former kite habitat of scattered trees, open spaces and dense grass had been cleared for agriculture, the kites moved into nearby orchards where the ground cover was mowed and left as mulch, creating rodent habitat and providing a prey base for the kites. The recent increase in retired cropland and irrigated pecan orchards in southeastern Arizona may provide additional new nesting habitat for kites in this state.

A complete list of Black-shouldered Kite sightings in Arizona through September 1984 is available from the authors.

ACKNOWLEDGMENTS

We thank Rick Bowers, Sidney Franklin, Don Garver, Kenn Kaufman, John and Seymour Levy, G. Scott Mills, Arnold Moorhouse, Richard Todd, Sheryl Vaughan and Janet Witzeman for providing data used in this article, Jane Church, Jeff Humphrey, Melvin Persons and Robert Semmler for assisting in data collection, and John Levy for use of the kite photograph.

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Accepted 7 November 1984

Black-shouldered Kite *Sketch by Keith Hansen*

TREASURER'S REPORT

WESTERN FIELD ORNITHOLOGISTS, INC.

Cash Flow Statement for 1 January 1983 to 31 December 1983

Cash on hand, 1 January 1983		$ 7,045.67
RECEIPTS		
Memberships	$ 9,857.30	
Boat Trips	5,030.00	
Annual Meeting	2,212.00	
Back Issues	204.00	
Reprints	745.44	
Interest	78.92	
Miscellaneous	16.50	18,144.16
DISBURSEMENTS		
Western Birds	$ 14,161.78	
Boat Trips	4,167.27	
Annual Meeting	1,126.26	
Membership/Business Services	823.70	
Postage	1,321.48	
Miscellaneous	89.88	21,690.37
Cash on hand, 31 December 1983		$ 3,499.46

J. Garth Alton, *Treasurer*

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AVIFAUNAL CHANGES IN CENTRAL OREGON SINCE 1899

BRIAN SHARP, Box 111, Fossil, Oregon 97830

Loye Holmes Miller, attached as a young ornithologist to a primarily fossil-collecting expedition to the John Day Basin in central Oregon in 1899, collected and recorded the birds he encountered at three sites. Two of the sites — Bridge Creek, 16 km northwest of Mitchell, Wheeler Co., and Blue Basin, 19 km north-northwest of Dayville, Grant Co.—were described in sufficient detail to allow them to be relocated. This paper compares the results of bird surveys conducted in 1983 at those two locations with the information provided in Miller's accounts, to determine what changes in the avifauna might have occurred since 1899.

METHODS

References to topographical features, vegetation, and the few place names mentioned in the texts of accounts of the expedition (Merriam 1901, Miller 1904, Miller 1950, Shotwell 1972) were used to identify as closely as possible the center of Miller's ornithological activities. The surrounding countryside within 3-4 km was explored for birds, as Miller did in 1899. I attempted in the 1983 survey to cover areas and habitats specifically mentioned in 1899, and excluded habitats Miller apparently did not visit, e.g., coniferous forest above Blue Basin. In 1983 I surveyed the Bridge Creek site from 16-20 June and Blue Basin from 21-23 June. Miller spent 12 days (1-12 June) at the Bridge Creek site and 10 days (19-28 June) at Blue Basin, though approximately half of his time was spent helping with the paleontological effort. Amount of effort and time of year were thus comparable in both years, though the spring of 1899 was phenologically later than that of 1983.

Avifaunal information contained in Miller's 1904 account was tabulated to include his statement of relative abundance when provided, whether a species was collected, or presence or absence of a species if other data were unavailable. In 1983 no systematic random sampling method was employed, but the amount of time spent in each habitat type and the number of observations of each species were recorded. More precise details on locations and effort are included in an appendix to the report on this study on file with the Oregon Department of Fish and Wildlife, La Grande, OR 97850.

RESULTS AND DISCUSSION

A comparison of the bird species and their relative abundances is presented in Table 1. The data contain obvious limitations insofar as comparability is concerned, the main one being the difficulty of surveying precisely the same areas in 1983 as in 1899 with the same amount of effort. The apparent lateness of the 1899 spring may account for small discrepancies in that some species Miller found in 1899, e.g., Evening Grosbeak, may have been migrants. Miller's not finding some species in 1899 which were present in 1983 may have been due more to methodology than to actual changes in

bird species composition, in that his preoccupation with collecting specimens is different from identifying birds with modern optical equipment and by song. In addition, Miller may not have recorded certain common species at a particular site, e.g., Western Meadowlark, perhaps because he encountered them everywhere. Finally, species may have been missed on either survey due to their low detectability or low density, e.g., accipiters, Common Poorwill and perhaps Pinyon Jay. Nevertheless, certain changes at the community level, and some even at the species level, can be detected by examining the patterns of differences and similarities in the data.

Blue Basin

The uplands at Blue Basin were primarily grassland in 1899 and were overgrazed (Merriam 1901). Western Junipers (*Juniperus occidentalis*) were relatively scarce and probably confined to draws, and Western Birch (*Betula occidentalis*), alder (*Alnus sp.)*, willows (*Salix* sp.), and other deciduous growth was present near springs and along streams. In 1983 junipers were more abundant, and the grassland was in excellent condition after three years of above-average rainfall. Many of the bird species present in 1899 were also present in 1983, especially the shrub-steppe species — Brewer's, Vesper and Lark sparrows — suggesting a degree of habitat similarity. Blue and Sage grouse, however, were not found in 1983, and Rhys Humphreys, a local rancher, was of the opinion that these and the White-tailed Jackrabbit (*Lepus townsendii*), another grassland species, seemed to have disappeared. Some species not recorded in 1899 — California Quail, Ring-necked Pheasant, Chukar, Rock Dove and European Starling — were introduced. A significant difference in 1983 was the addition of a complex of woodland and woodland-edge species — Chipping Sparrow, Mountain Chickadee, Loggerhead Shrike and perhaps Red-tailed Hawk — a result of the increase of juniper that has occurred since 1899. The difference is one of degree, as certain juniper or woodland dependent species — Black-billed Magpie, Ash-throated Flycatcher, Black-throated Gray Warbler, Northern Oriole and American Robin — were present in both 1899 and 1983. Yellow Warblers were not found in 1983; the limited amount of deciduous riparian growth Miller camped beneath was present only as broken remnants in 1983, except at elevations above 1230 m. In 1983, Lewis' Woodpecker was not observed, whereas Mountain Bluebird was recorded in slightly greater numbers. The European Starling, found nesting and in foraging flocks in 1983, is known to adversely affect these cavity nesters. The absence from the 1899 record of the larger raptors — Golden Eagle, buteos, Prairie Falcon and Common Raven — all found in 1983, was probably a result of human persecution.

Bridge Creek

At Bridge Creek, the presence of a perennial stream and its associated floodplain creates a greater diversity of habitat types than occurs in the uplands of Blue Basin. The differences reflected in the data noticeably outweigh the degree of overlap, and numerous changes have occurred involving whole avian communities.

In the upland habitats at Bridge Creek, the results were similar to those obtained at Blue Basin. Various grassland species were present in both surveys,

and species dependent on an increased amount of juniper woodland habitat were added in 1983. Pinyon Jays were not found in 1983.

An obvious difference at Bridge Creek in 1983 was the occurrence of waterfowl and other water-associated species such as Bank Swallow, Spotted Sandpiper, Red-winged and Yellow-headed blackbirds, and perhaps Vaux' Swift, which were not recorded in 1899. The addition of these species is the result of new waterbird habitat created by a dam and approximately 30 ha irrigation reservoir on a tributary of Bridge Creek near the site of the 1899 camp.

The most significant change at Bridge Creek has occurred in the bird community of the riparian zone. A whole complex of riparian species found by Miller in 1899 — Black-headed Grosbeak, Warbling Vireo, American Goldfinch, Rufous-sided Towhee, Common Yellowthroat, Wilson's Warbler and Western Wood-Pewee — were absent in 1983, and two other species characteristic of the riparian zone, Yellow-breasted Chat and Lazuli Bunting, were found in lower numbers in 1983. Similar reductions in species diversity and abundance have been found recently in Nevada (Oakleaf and Klebenow 1975) and California (Gaines 1974). A loss of riparian habitat or its structural deterioration at the Bridge Creek site is implied by these data. However, populations of riparian bird species may have been reduced by a loss of habitat in the general area and thus be absent from the isolated patches of riparian habitat present at the site in 1983. A possible increase in the population of cowbirds and associated parasitism may have been a contributing factor. Riparian woodland species are still well represented along Bridge Creek at the nearby town of Mitchell, where the town and/or fragmented landownership patterns protect the riparian zone from agricultural impacts.

Table 1. Comparison of bird species, occurrence and relative abundances in the vicinity of Bridge Creek (T10S, R20E, Sec 25), Wheeler Co., and Blue Basin (T11S, R26E, Sec 21), Grant Co., Oregon, 1899 and 1983.

SPECIES	BRIDGE CREEK 1899	BRIDGE CREEK 1983	BLUE BASIN 1899	BLUE BASIN 1983
Mallard *Anas platyrhynchos*	—	5		
Gadwall *Anas strepera*	—	6		
Cinnamon Teal *Anas cyanoptera*	—	2		
American Wigeon *Anas americana*	—	2		
Accipiter sp.			—	1
Red-tailed Hawk *Buteo jamaicensis*	—	5	—	4

Table 1 (Cont.)

SPECIES	BRIDGE CREEK 1899	BRIDGE CREEK 1983	BLUE BASIN 1899	BLUE BASIN 1983
Golden Eagle *Aquila chrysaetos*	—	2		
Prairie Falcon *Falco mexicanus*	—	1		
American Kestrel *Falco sparverius*	present	10	—	9
Blue Grouse *Dendragapus obscurus*			common	—
Sage Grouse *Centrocercus urophasianus*			common	—
California Quail *Callipepla californica*	—	4	—	9
Ring-necked Pheasant *Phasianus colchicus*	—	2		
Chukar *Alectoris chukar*	—	3	—	4
American Coot *Fulica americana*	—	20		
Killdeer *Charadrius vociferus*	—	16	—	2
Spotted Sandpiper *Actitis macularia*	—	3		
Rock Dove *Columba livia*	—	2		
Mourning Dove *Zenaida macroura*	present	6	common	5
Western Screech-Owl *Otus kennicottii*	—	2		
Great Horned Owl *Bubo virginianus*	present	2	—	3
Common Poorwill *Phalaenoptilus nuttallii*	common	—	—	1
Common Nighthawk *Chordeiles minor*	—	24	present	7
Vaux's Swift *Chaetura vauxi*			—	4
Black-chinned Hummingbird *Archilochus alexandri*			—	5
Northern Flicker *Colaptes auratus*	—	11	nesting	8
Lewis' Woodpecker *Melanerpes lewis*	abundant	—	nesting	—
Western Kingbird *Tyrannus verticalis*			present	9
Ash-throated Flycatcher *Myiarchus cinerascens*	—	4	present	1
Say's Phoebe *Sayornis saya*	—	14	—	1
Willow Flycatcher *Empidonax traillii*	—	1		

Table 1 (Cont.)

SPECIES	BRIDGE CREEK 1899	BRIDGE CREEK 1983	BLUE BASIN 1899	BLUE BASIN 1983
Gray Flycatcher *Empidonax wrightii*			—	2
Western Wood-Pewee *Contopus sordidulus*	present	—	—	1
Violet-green Swallow *Tachycineta thalassina*	present	2	—	4
Bank Swallow *Riparia riparia*	—	8		
Northern Rough-winged Swallow *Stelgidopteryx serripennis*	present	4		
Barn Swallow *Hirundo rustica*	present	2		
Cliff Swallow *Hirundo pyrrhonota*	—	2		
Black-billed Magpie *Pica pica*	present	17	common	6
Common Raven *Corvus corax*	—	4	—	5
American Crow *Corvus brachyrhynchos*	—	4	nesting	—
Pinyon Jay *Gymnorhinus cyanocephalus*	present	—		
Mountain Chickadee *Parus gambeli*	—	1	—	7
Bushtit *Psaltriparus minimus*	—	1	—	1
Canyon Wren *Catherpes mexicanus*	present	—	present	1
Rock Wren *Salpinctes obsoletus*	common	16	—	11
American Robin *Turdus migratorius*	common	14	present	31
Mountain Bluebird *Sialia currucoides*	1	4	—	6
Loggerhead Shrike *Lanius ludovicianus*	—	6	—	1
European Starling *Sturnus vulgaris*	—	79	—	49
Warbling Vireo *Vireo gilvus*	collected	—		
Orange-crowned Warbler *Vermivora celata*			—	1
Yellow Warbler *Dendroica petechia*	present	6	abundant	—
Black-throated Gray Warbler *Dendroica nigrescens*	common	2	—	3
MacGillivray's Warbler *Oporornis tolmiei*			collected	1
Common Yellowthroat *Geothlypis trichas*	abundant	—		

Table 1 (Cont.)

SPECIES	BRIDGE CREEK 1899	BRIDGE CREEK 1983	BLUE BASIN 1899	BLUE BASIN 1983
Yellow-breasted Chat *Icteria virens*	common	1		
Wilson's Warbler *Wilsonia pusilla*	collected	—		
Western Meadowlark *Sturnella neglecta*	present	85	—	55
Yellow-headed Blackbird *Xanthocephalus xanthocephalus*	—	1		
Red-winged Blackbird *Agelaius phoeniceus*	—	27		
Northern Oriole *Icterus galbula*	abundant	23	present	4
Brewer's Blackbird *Euphagus cyanocephalus*	present	80	—	26
Brown-headed Cowbird *Molothrus ater*	present	12	—	7
Western Tanager *Piranga ludoviciana*	common	—	occasional	1
Black-headed Grosbeak *Pheucticus melanocephalus*	collected	—	present	—
Lazuli Bunting *Passerina amoena*	abundant	1	—	3
Evening Grosbeak *Coccothraustes vespertinus*	collected	—		
Cassin's Finch *Carpodacus cassinii*			1	2
House Finch *Carpodacus mexicanus*	—	3	common	2
American Goldfinch *Carduelis tristis*	collected	—	—	1
Green-tailed Towhee *Pipilo chlorurus*			—	3
Rufous-sided Towhee *Pipilo erythrophthalmus*	collected	—	collected	10
Savannah Sparrow *Passerculus sandwichensis*	—	2		
Vesper Sparrow *Pooecetes gramineus*			present	11
Lark Sparrow *Chondestes grammacus*	—	9	present	15
Black-throated Sparrow *Amphispiza bilineata*	—	3		
Dark-eyed Junco *Junco hyemalis*	—	3	collected	6
Chipping Sparrow *Spizella passerina*	—	12	—	39
Brewer's Sparrow *Spizella breweri*	common	—	present	17
Song Sparrow *Melospiza melodia*	common	4		

Another major change at Bridge Creek has occurred in the climax tall shrub community of the flat alluvial bottomland (Youtie and Winward 1977). In 1899 the Greasewood (*Sarcobatus vermiculatus*) and Big Sagebrush (*Artemisia tridentata*) that occupied this bottomland provided nesting habitat for Brewer's Sparrow and Lazuli Bunting, and foraging habitat for other species, e.g., American Robin and Western Wood-Pewee. Extensive stands of this plant community are now virtually absent along Bridge Creek, having been converted to cultivated fields (hayfields and fallow land), which provide habitat for nesting Killdeer and Savannah Sparrows and for foraging flocks of blackbirds and starlings. By chance, 63 acres of bottomland were acquired by the National Park Service as a buffer to the Painted Hills National Monument. Three singing male Black-throated Sparrows, a species rarely encountered at this latitude, were found here in 1983.

Insofar as single species are concerned, the most disturbing change was the absence in 1983 of the Lewis' Woodpecker, which Miller found "quite abundant" at Bridge Creek in 1899. Although this species may nest opportunistically in response to local food abundance (Bock 1970), and food may have been locally abundant in 1899, the Lewis' Woodpecker is also apparently a secondary cavity nester, and competition for nest sites from starlings may have contributed to its local extirpation at both Bridge Creek and Blue Basin. In recent years, Lewis' Woodpecker populations have been declining at the rate of 5.5% per year west of the Rocky Mountains (Robbins et al., unpub. rep.), and the species is considered "sensitive" or declining and of concern (U.S. Fish and Wildlife Service 1982).

ACKNOWLEDGMENTS

I would like to dedicate this paper to the late Ron Rohweder, Oregon Department of Fish and Wildlife, La Grande, who was a source of encouragement throughout planning and implementation stages. Financial support was provided by the Oregon Department of Fish and Wildlife Nongame Wildlife Program. I wish to thank Barbara McKinney for assistance with the field work. Jim Mack of the John Day Fossil Beds National Monument provided helpful information regarding the location of Miller's campsites. Paul Collins, rancher, generously allowed us to camp at his ranch on Bridge Creek. David Marshall, Harry Nehls and Mark Smith provided valuable comments on the manuscript.

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Accepted 14 March 1984

Lewis' Woodpecker *Sketch by Narca Moore-Craig*

ROYAL TERN NESTING ATTEMPTS IN CALIFORNIA: ISOLATED OR SIGNIFICANT INCIDENTS?

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Only four nesting attempts are known for the Royal Tern (*Sterna maxima*) in California, all at the San Diego Bay salt evaporating ponds. This paper describes the two most recent nesting attempts in detail and discusses all four attempts in terms of coincidental events in California fish stocks of the close inshore area.

PREVIOUS NESTING RECORDS

The first known nesting attempts in California by both the Royal Tern and Elegant Tern (*S. elegans*) occurred in 1959 on the dikes separating the salt evaporating ponds at the south end of San Diego Bay, San Diego County, California (Gallup and Bailey 1960). The attempt, by a single pair of Royal Terns, failed. The egg was collected by Gallup and is on deposit at the Western Foundation of Vertebrate Zoology, Los Angeles (WFVZ 114, 199-1). It measures 62.8 x 44.9 mm.

In 1960 a second nesting attempt was reported without details (Small 1960) to have involved at least 30 nests and produced many young, but no nests of this species were found in 1961 (Small 1961).

RECENT NESTING ATTEMPTS

In spring of 1980 a single pair of Royal Terns attempted to nest on the saltworks dike separating ponds 35 and 33 (circled "a," Figure 1) in the colony of Elegant Terns, which numbered 607 breeding pairs in 1980, 861 in 1981 and 800 in 1982. The nest scrape with its single egg was located on the periphery of a group of 32 Elegant Tern scrapes. Amongst this group also were three Caspian Tern (*S. caspia*) nests—two containing two eggs and one containing three eggs. (The number of Caspian Tern breeding pairs at the saltworks was roughly 400 in 1980 and 1981 and roughly 350 in 1982.)

I discovered the Royal Tern egg on 9 May and at that time one Royal Tern could be seen nearby. Later that afternoon, from a vantage point off the breeding dike, I saw two Royal Terns together at the nest and observed them for about 2 hours, until darkness set in. On 11 May I did not see the Royal Terns at the nest site and I found the egg with a number of puncture holes, cracked and lying in a pool of its own former contents. This was apparently the work of Ruddy Turnstones (*Arenaria interpres*), which I had previously observed destroying Elegant Tern eggs in a similar fashion, much like the Ruddy Turnstone predation on Sooty Tern (*S. fuscata*) eggs on Eniwetok Island (Crossin and Huber 1970). Within a few days the Royal Terns were no longer seen in the area.

I collected the damaged egg and deposited it at the Western Foundation of Vertebrate Zoology (WFVZ 125, 645). It measures 68.0 x 40.8 mm, which compares favorably with other eggs in the WFVZ collection, as well as with

the measurements of 63 x 45 mm suggested by Harrison (1978) as average for Royal Tern eggs.

The most recent breeding by Royal Terns occurred at the San Diego saltworks during 1982. On 8 May I discovered two Royal Tern nest scrapes, each with a single egg, in a group of about 230 Elegant Tern nest scrapes atop the north to south running arm of dike 33/5 (circled "b," Figure 1). The first nest was with a group of three Elegant Tern nests, placed about 1 m from the south edge of the large Elegant Tern nesting group. The second nest was about 10 m north of the first nest, towards the middle of the large Elegant Tern nesting group and on its western periphery.

The egg of the first nest measured 62.4 x 42.3 mm and had an off-white ground color with an approximately random pattern of medium-to-large dark brown spots, and was similar in appearance to the 1980 egg. The egg of the second nest had a pale beige or buff ground color and was completely covered with a rather uniform pattern of small-to-medium dark brown spots. It measured 62.9 x 42.8 mm.

On 10 June the first nest contained a chick which may have hatched up to 2 days previously. The chick had bright orange legs and bill. Its down was a pale yellow color, lightly overlaid with small brown spots.

On 18 June the second nest contained a chick which was approximately 3 days old. This chick also had bright orange legs and bill but its down was a medium yellow-beige color, heavily overlaid with medium-to-large dark brown spots.

On this visit I banded both chicks (USFWS bands 664-81701 and 664-81702), each on the left leg. I also examined the nest scrapes and in the first nest I found two Northern Anchovies (*Engraulis mordax*) measuring 6.0 and 7.2 cm, standard lengths. I also recovered a regurgitation consisting of a small 6.2 cm (standard length) Northern Anchovy from the older chick. The regurgitations of the smaller Elegant Tern chicks consisted of *larger* specimens of *E. mordax*, ranging from 8.0 to 13.2 cm (standard length) and averaging 10.0 to 11.0 cm (standard length).

After the banding and above-mentioned collections were completed, the older chick became ambulatory while the younger chick remained quiet in its nest. On 23 June both Royal Tern chicks had entered the creche (nursery flock) of Elegant Tern chicks. On this visit and again on 1 July I recovered both chicks from the creche and collected their regurgitations. The regurgitations consisted primarily of partially digested tail pieces. These appeared to be fragments of fairly large (15 to 20 cm) atherinids, probably the very common Topsmelt (*Atherinops affinis*). Some fragments were probably surfperch (Embiotocidae). I also recovered a 5.5 cm (standard length) specimen of an anchovy, *Anchoa*.

Interestingly, on all visits up to 23 June each Royal Tern chick was attended by both parents, unlike the Elegant Tern chicks which were usually attended by only one parent or left unattended in the creche. On 1 July I found the younger chick attended by both parents and the older chick attended by a single parent.

During the last week of May 1982 the Elegant Tern colony was invaded by a pair of stray dogs. They destroyed a section of the colony on the northeast to southwest running arm of the dike 33/5 and on dike 36/37 (Figure 1) which

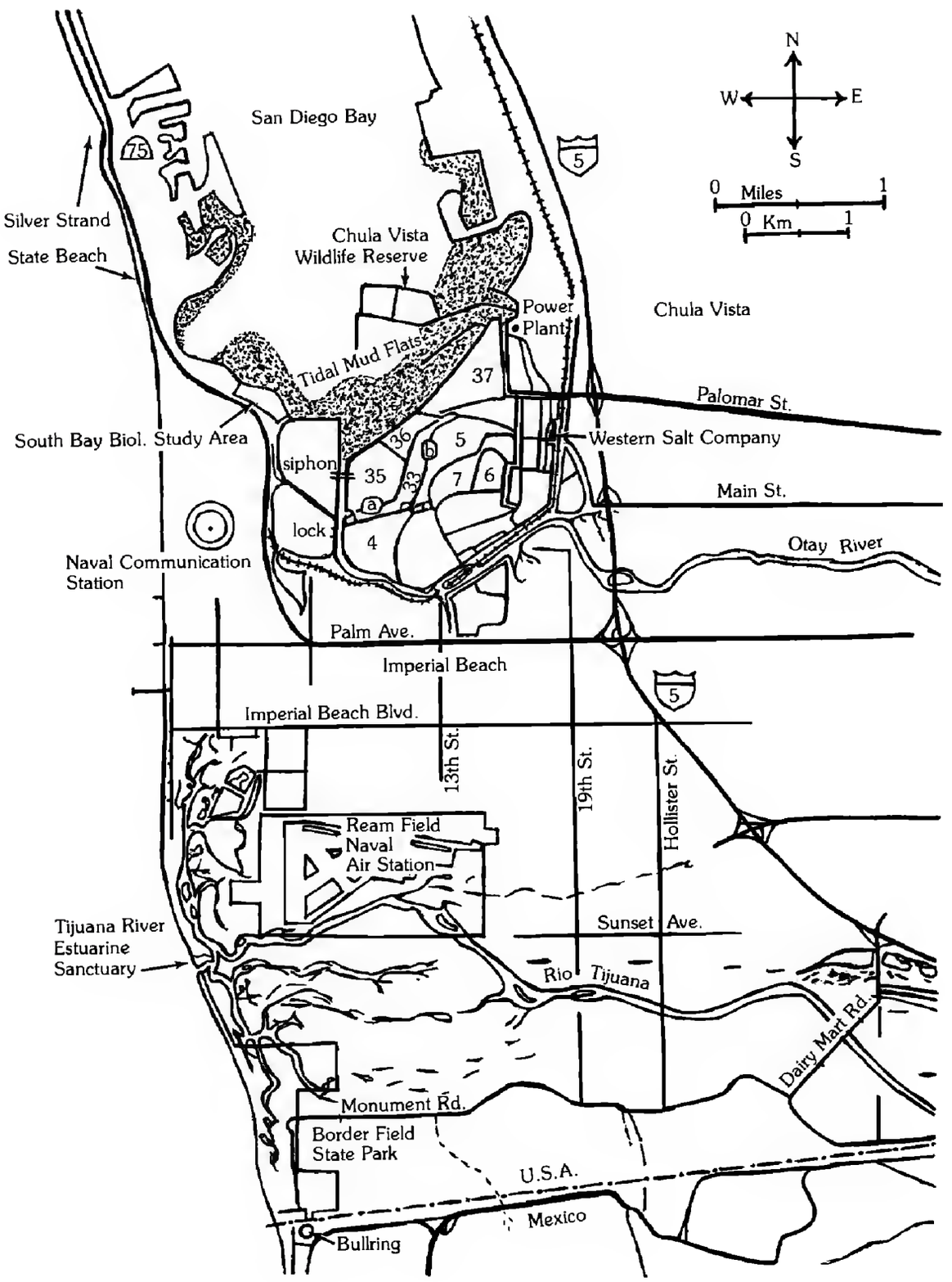

Figure 1. The south San Diego Bay area including the salt evaporating ponds and the Tijuana River sloughs (Tijuana River Estuarine Sanctuary): a = the location of the unsuccessful 1980 Royal Tern nesting attempt; b = the location of the 1982 successful nesting by two pairs of Royal Terns.

had few nests of aggressive Caspian Terns associated with it, leaving this area almost completely unprotected. I found over 100 dead Elegant Tern chicks, all badly mauled. Many more chicks were missing. Fortunately, however, the section of the colony in which the Royal Tern chicks were located had many associated Caspian Tern nests. The dogs never penetrated this area and both Royal Tern chicks were seen in the creche again on 19 June, capable of short hop-and-glide flights.

By this time the Royal Tern chicks were visited only intermittently by one or both parents and, by 1 August, either chick could be seen flying, following one or both of its parents over the saltworks or over the Tijuana River sloughs (Tijuana River Estuarine Sanctuary, Figure 1), where the Royal Terns frequently foraged. On such occasions the parent that was followed usually carried a large fish. I was seldom able to identify positively the fish being carried, but in very few instances did the fish show the familiar silver and black appearance of *E. mordax*, which constitutes the great bulk of the Elegant Tern diet (Schaffner 1982). I tentatively identified most of these fish as Atherinidae, again, probably Topsmelt.

DISCUSSION

Although there may have been other intermittent but unreported Royal Tern nesting attempts at the San Diego saltworks during the past 25 years, the possibility seems unlikely, given the many very competent observers visiting the saltworks over the years.

The nearest Royal Tern breeding colony is on Isla Raza, Mexico, roughly 600 km south of San Diego in the Gulf of California, Mexico, where they breed in mixed groups with Elegant Terns and Heermann's Gulls (*Larus heermanni*; Walker 1965, Lindsay 1966). A portion of the populations of all three species migrates north into California at the close of each breeding season and this site is almost certainly the point of origin of the Royal Terns which nested at San Diego, as well as the San Diego Elegant Tern breeding population itself, as Isla Raza appears to be the closest and largest regularly active colony.

Schaffner (1982) discussed the dependence of California Elegant Terns (both breeding and visiting) on *E. mordax*, noting that the establishment of the San Diego Elegant Tern breeding population coincided with the expansion of *Engraulis* stocks in southern California waters and that current seasonal movements of California Elegant Terns and *Engraulis* are roughly similar.

Royal Terns, however, have not followed the same trends as Elegant Terns in California. Although Royal and Elegant terns typically occur together in San Diego Bay immediately before and after the nesting season, visiting Royal Terns occur in California relatively more often in winter and less often in fall and spring, in contrast to Elegant Terns, which are more commonly seen in the fall and the spring than in winter. What is especially interesting is that the occurrence of the Royal Tern in California has, except perhaps for these recent years, decreased markedly since 1950 (Cogswell 1977). Thus, the historical occurrence of the Royal Tern in California is unlikely to have been related to Northern Anchovy abundance and distribution but is likely to be related to the abundance and distribution of the Pacific Sardine (*Sardinops sagax*), which experienced a tremendous population crash in the 1940s resulting in near extinction by 1950 (MacCall 1979, 1984). Ainley and Lewis

(1974) and Baldridge (1973) presented very good evidence regarding the severe impact of the disappearance of Pacific Sardines on cormorants, puffins and especially on Brown Pelicans (*Pelecanus occidentalis*) in California waters farther north (Farallon Islands and Monterey).

Although the commercial sardine fishery was primarily centered around Monterey, the Pacific Sardine was very widely distributed throughout California waters, extending from far offshore to shallow inshore areas (Murphy 1966, 1968). According to many old-time fishermen in the San Diego area, during their peak population years such as 1936, sardines could be found in great abundance inshore within the breakers and just a few meters from the beach. With the possible exception of *E. mordax* during its period of peak abundance in the 1960s (Smith 1972, Smith and Eppley 1982), there has thus far been no significant replacement of the Pacific Sardine by any species in close inshore areas.

The close inshore components of the sardine and other fish populations are of particular interest because the Royal Tern tends to be a warm-water littoral species and is primarily an inshore coastal forager (Murphy 1936, Buckley and Buckley 1972, Blake 1977), in contrast to the small-bodied "crested terns" (*Thalasseus* subgenus; AOU 1976) such as the Elegant Tern, which tends to forage farther offshore (Schaffner 1982). Furthermore, the other large-bodied crested tern, the Swift or (Greater) Crested Tern (*S. bergii*), is also an inshore forager (Ashmole 1968, Hue and Etchecopar 1970, Henry 1971, Feare 1975, Etchecopar and Hue 1978); in Australia *S. bergii* is recognized as an indicator of shoals (schools) of Pilchard, a *Sardinops* sardine (Serventy et al. 1971).

Sardine abundance in California remained extremely low during the 1950s, but during a warm-water period from 1957 to 1960, Pacific Sardine (and *Engraulis*) stocks briefly improved (MacCall 1979, 1984). Royal Terns nested in San Diego in 1959 and 1960 (Gallup and Bailey 1960; Small 1960, 1961), and many other marine organisms also extended their ranges northward during 1957 to 1960 (Radovich 1960, 1961).

Like most of the other crested terns, the Royal Tern tends to be non-aggressive towards most potential predators and may require the presence of other, more aggressive larids at its breeding colonies for protection, in addition to topographical requirements such as relatively isolated locations with good visibility of surroundings. In European Sandwich Tern (*S. sandvicensis*) colonies this protection is provided by the Common Black-headed Gull (*Larus ridibundus*; Veen 1977), and in southeastern U.S. Royal Tern colonies, protection may be provided by the Laughing Gull (*L. atricilla*; Buckley and Buckley 1972). In coastal California an important aggressive predator-mobbing larid is the Caspian Tern, which provides the San Diego Elegant Tern colony with predator protection in a fashion similar to that of the medium-sized gulls mentioned above (Schaffner 1982). Thus, the prior establishment ca. 1940 of the Caspian Tern breeding colony (Emblen 1954, Schaffner 1982, Gill and Mewaldt 1983) was probably a prerequisite for Elegant and Royal tern breeding at the San Diego saltworks.

Considering the above, it is unlikely that any adequate breeding site for Royal Terns existed within easy reach of the food supply during the period of peak *Sardinops* abundance. Significant Caspian Tern breeding colonies did

Figure 2. Royal Tern (foreground) and Elegant Tern at San Diego, May 1982.

Figure 3. Nesting Royal Tern (center foreground) with nesting Elegant and Caspian terns at San Diego, May 1982.

Figure 4. Royal Tern egg (of first nest of 1982 at San Diego), center, compared to Elegant Tern egg (left) and Caspian Tern egg (right).

Figure 5. Chick of first Royal Tern nest of 1982 at San Diego, in its nest scrape.

Photos by Fred C. Schaffner

not exist in coastal California at that time; the establishment of the San Diego and other coastal California breeding colonies was apparently the result of extensive alteration of inland nesting habitat between 1910 and 1940 which forced Caspian Terns to seek other nesting areas. The major California Caspian Tern colonies now occur along the coast and, like the San Diego colony, tend to be associated with human-created habitats (Gill and Mewaldt 1983). The recent successful nesting of two pairs of Royal Terns is in part also due to the presence of the Elegant Terns, with whom they share the important social characteristics of extremely dense and gregarious nesting groups and creche formation.

The recent California Royal Tern breeding probably indicates some degree of change in the local coastal marine environment and its fish fauna. Southern California coastal waters have been experiencing a slight warming trend over the past few years (Alec MacCall pers. comm. 1982) and there has been a slight increase in Pacific Sardine abundance as well, though this change should in no way be taken as the beginning of a recovery (Klingbeil 1981). The important factors relevant to Royal Tern breeding in California, however, are the abundance and availability of close inshore schooling fishes in general, and not *Sardinops per se*.

The fishes of greatest interest are the atherinids and engraulids which inhabit the several river mouths and adjacent estuaries of northern San Diego County, the shallow water areas of the Coronado Islands and especially the Tijuana River sloughs, a principal foraging area for the Royal Terns which bred at San Diego. Atherinids of various age classes are common and abundant and may be increasing in the Tijuana River sloughs and adjacent areas; and, although detailed information is as yet unavailable, some circumstantial evidence suggests an increase in the abundance of larval and juvenile stages of the engraulid, *E. mordax*. Larval and juvenile *Engraulis* of up to about 6.0 cm standard length have become increasingly apparent over the past two breeding seasons (1981 and 1982) at the nest sites of the 1000 or so Forster's Terns (*S. forsteri*) which breed at the San Diego saltworks. *Engraulis* specimens of up to 1 year of age (roughly 10.0 cm standard length; Huppert et al. 1980) were first observed at Caspian Tern nest sites in 1981 and were quite apparent in 1982. Specimens of 1- to 2-year-old *Engraulis* measuring 11.0 to 15.0 cm were commonly found at Caspian Tern nests in 1981, somewhat less commonly in 1982, but not at all in 1980. Yet, *Engraulis* is a minor component of the local Caspian Tern diet, the major component being the large 15.0 to 25.0 cm Topsmelt from the Tijuana River sloughs and other nearby coastal saltwater and brackish water areas.

Additional circumstantial evidence of an increase in the abundance of close inshore fishes comes from Black Skimmers (*Rynchops niger*), which first began breeding at the San Diego saltworks in small numbers during the mid-1970s (Gerald Collier, Michael Evans pers. comm.). The Black Skimmer population increased to some 60 pairs in 1982. Fishes collected at their nest sites include 2.0 to 6.0 cm Longjaw Mudsuckers (*Gillichthys mirabilis*), 4.0 to 6.0 cm California Halibut (*Paralichthys californicus*) and an abundance of larval and juvenile atherinids and engraulids measuring up to about 7.0 cm. During 1982, engraulids measuring 4.0 to 6.0 cm and *Paralichthys* of similar lengths were especially apparent.

SUMMARY

Royal Terns visiting California prior to 1950 probably relied heavily on Pacific Sardines as a food source. At present Royal Terns appear to feed on atherinids and engraulids. The establishment of the Caspian Tern breeding colony at San Diego was probably a prerequisite for the utilization of that site by both Royal and Elegant terns. The recent (1980, 1982) Royal Tern nesting attempts in California may not be mere isolated incidents, but may indicate at least local changes in the coastal marine environment and its fish fauna, particularly increases in some close inshore fish stocks. Future increases or decreases in the abundance and frequency of occurrence of both visiting and nesting Royal Terns are likely to reflect similar changes in the abundance and availability of their food supply.

ACKNOWLEDGMENTS

I wish to thank the Western Foundation of Vertebrate Zoology for access to its egg collection and Ed Hamilton who measured the Gallup egg. For many useful comments and suggestions I wish to thank Alec MacCall, Howard L. Cogswell and Michael Evans. This is Contribution 151 of the program in Ecology, Behavior and Tropical Biology of the Department of Biology, University of Miami.

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Accepted 17 November 1984

THE MARINE BIRDS OF ALIJOS ROCKS, MEXICO

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Alijos Rocks (24°57'N, 115°45'W) lie 185 nautical miles almost due west of Cabo San Lazaro, off southwestern Baja California, Mexico (Figures 1-5). Their jagged, volcanic spires consist of three main stacks and numerous smaller rocks. South Rock, the largest of the group, rises 34 m above the sea; North Rock is 22 m high and Middle Rock, the smallest, is approximately 18 m high. The total top surface area of the three main pinnacles is under ¼ acre (0.1 hectare).

The only published accounts of biological surveys of Alijos Rocks come from Hanna (1926) and McLellan (1926), who spent 3 hours rowing among the rocks on 24 April 1925, and Murphy (1958) who visited the area on 9 November 1956. Since 1974 I have passed by these pinnacles five times recording bird and mammal observations while aboard research vessels. A list of survey dates and pertinent comments is given in Table 1. In addition, Bayard Brattstrom visited Alijos Rocks on 10 May and 15 November 1953, and David Au surveyed them on 7 December 1976 by helicopter from a passing research vessel.

Although Alijos Rocks maintain only small populations, the composition of the avifauna, with mixed zoogeographic affinities, is unique. It therefore seems worthwhile to update the current status of marine birds that occur there.

SPECIES ACCOUNTS

EARED GREBE (*Podiceps nigricollis*). A pair was swimming close to the rocks on 14 January 1983.

LAYSAN ALBATROSS (*Diomedea immutabilis*). There are no historical accounts of any albatrosses from Alijos Rocks. I first saw Laysan Albatrosses there on 29 February 1976, when 10 were present around the rocks, including 6 on the water between two of the larger stacks. Later that year D. Au (pers. comm.) reported one in the area on 7 December. On 15 May 1982, four were present, and when I passed near the area again on 14 January 1983 approximately 15 were soaring in the updrafts of the pinnacles or swimming on the water. Up to 12 were sitting on the water next to the ship as we drifted around the rocks on 10 April 1983, and 4, probably different birds, followed the ship several miles north of Alijos Rocks.

During the January 1983 visit to Alijos Rocks small groups of 4 to 6 albatrosses were sitting on the water facing each other, clapping their bills, and bobbing their heads up and down rapidly. They were also bowing forward, turning their wings up, and dipping their bills into the water off to the side; they appeared to lock beaks occasionally. In April 1983 bill-clapping was still common and I regularly heard a whistling whinny as the birds sat on the water near the vessel. No head-bobbing was noted at that time but some head and face allo-preening was observed. These behaviors are important components of the breeding displays of the Laysan Albatross (Rice and Kenyon 1962b). In January 1983, one (or more?) albatross flew over South Rock several times and dropped its feet as it stalled less than 0.5 m over the surface of the stack in an apparent attempt to land. Each time it averted at the last moment and was never actually seen to alight.

Table 1. Surveys of Alijos Rocks, Mexico, by the author.

Date	Sea Temperature (°C)	Comments
16 Nov. 1974	21.1	Passed 1.5 nautical miles off east side of the rocks stopping <10 min.
29 Feb. 1976	18.7	Spent 5 hrs. in the morning drifting and fishing 0.5 nautical miles off rocks.
15 May 1982	18.5	Cruised along west side of rocks 0.5 nautical miles offshore without stopping; surveyed site with 25x, 150 mm mounted spotting binoculars.
14 Jan. 1983	20.4	Spent 50 min. circling the rocks at a distance of 0.5 nautical miles surveying with mounted spotting binoculars.
10 Apr. 1983	19.1	Drifted for 3.5 hrs. within 500 m of the rocks surveying with mounted spotting binoculars.

This species now occurs annually at Alijos Rocks for at least the duration of the breeding season (November-August in the Hawaiian Islands; Rice and Kenyon 1962b). None of the earlier expeditions to Alijos reported any species of albatross there and Sanger (1974) indicated that Laysans in the eastern Pacific range south only to about 28°N (northern Baja). Friedmann et al. (1950) reported they were "formerly fairly common" off central Baja but did not elaborate. Other records, however, show that Laysan Albatross does occur off southern Baja California, and occasionally further south, with some regularity. Perhaps this occurrence is recent.

Table 2 lists additional sightings of Laysan Albatrosses from Baja California and elsewhere in the southeast portion of its range. Dunn and Unitt (1977) reported an inland sighting north of Salton Sea, California, on 5 May 1976, and surmised that the bird had become "trapped" in the Gulf of California and continued overland in its northward migration. A Laysan found in Yuma, Arizona, on 14 May 1981, one found dead near Blaire Valley, California, on 28 May 1982, and one present at Salton Sea, California, on 21 May 1984 all probably suffered the same fate (McCaskie 1984). While these records may only reflect an increase in observer coverage, they and other data suggest that the Laysan Albatross may be expanding its range.

Historically all of the North Pacific albatrosses (including Black-footed Albatross, *D. nigripes*, and Short-tailed Albatross, *D. albatrus*) were considerably more numerous and widespread than they are now. Japanese feather hunters at the turn of the century, and then World War II military operations, depleted albatross populations and even eliminated some colonies (Rice and Kenyon 1962a). Although no albatross has been known to breed in the eastern North Pacific in recent times, albatross colonies in the central and western North Pacific were more widely distributed prior to human interference (Rice and Kenyon 1962a).

At present almost all Laysan Albatrosses breed in the Leeward Hawaiian Islands, but very small numbers have also nested in the main Hawaiian Islands including Moku Manu off Oahu and on Niihoa (Richardson 1957), and more recently on Kilauea Point, Kauai (see Pyle 1983). Hasegawa (1978) recently reported nesting on Bonin Island, Japan, which is the only modern record away from the Hawaiian chain.

The Laysan is now by far the most abundant albatross in the North Pacific, and some of the large protected colonies in the Leeward Hawaiian chain are likely at pre-

exploitation levels and still growing (Rice and Kenyon 1962a, M. Naughton pers. comm.). If so, surplus birds may be available for colonization elsewhere in the North Pacific. This species typically nests on sandy atolls, but a few birds have bred on the tiny rocky stacks of Gardner Pinnacles in the Leeward Hawaiian Islands (Rice and Kenyon 1962a). Though there were no signs of actual nesting or even of adults roosting at Alijos Rocks in 1983, a breeding population may be established there in the near future.

BLACK-FOOTED ALBATROSS (*D. nigripes*). One, 20 nautical miles north of Alijos on 29 February 1976.

NORTHERN FULMAR (*Fulmarus glacialis*). Four all-dark fulmars scavenged around the boat as we fished just off the rocks in February 1976. In 1976 a huge influx of fulmars and Black-legged Kittiwakes occurred off the western United States, with large die-offs occurring at least as far south as southern California in February and March (Ainley 1976, Pitman pers. obs.). Fulmars normally venture as far south as Alijos only during "flight years."

Murphy (1958) collected a dark-phase fulmar on 12 December 1956 at 23°31'N, 111°22'W, which he felt was probably the southernmost record for a Northern Fulmar in any ocean. On 28 February 1976 I found a dead white-phase fulmar at 22°38'N, 115°15'W [San Diego Natural History Museum (SDNHM) 39789]. It was fairly fresh but may have drifted a considerable distance after dying. On 29 November 1983 I saw a dark-phase fulmar at 22°03'N, 114°55'W, and saw several others farther north.

Table 2. Laysan Albatross sightings off Baja California, Mexico.

Date	Position	Number	Observer
11 Apr. 1975	16°10'N 105°01'W	1	G. Friedrichsen
26 Feb. 1976	18°59'N 127°10'W	1	J. Dunn & P. Unitt (1977)
29 Feb. 1976	24°57'N 115°45'W (Alijos Rocks)	10	R. Pitman
7 Dec. 1976	24°57'N 115°45'W (Alijos Rocks)	1	D. Au
5 Jan. 1977	30°49'N 118°24'W	1	R. Pitman
4 Mar. 1979	19°00'N 111°00'W	2	D. Au
10 Mar. 1979	30°53'N 116°41'W	1	R. Pitman
4 Jan. 1980	29°53'N 118°03'W*	2	R. Pitman
18 Feb. 1980	10°33'N 113°40'W	1	G. Anderson
1 Mar. 1980	21°08'N 126°32'W	1	R. Pitman
3 Mar. 1980	26°50'N 121°54'W*	2	R. Pitman
4 Mar. 1980	30°25'N 120°13'W*	3	R. Pitman
22 Mar. 1980	28°11'N 115°59'W	1	R. Pitman
23 Mar. 1980	23°32'N 114°27'W	1	R. Pitman
2 Apr. 1981	20°28'N 110°35'W	1	J.R. Jehl, Jr.
21 Feb. 1982	24°49'N 113°12'W	1	R. Pitman
15 May 1982	24°57'N 115°45'W (Alijos Rocks)	4	R. Pitman
14 Jan. 1983	24°57'N 115°45'W (Alijos Rocks)	15	R. Pitman
7 Mar. 1983	29°39'N 117°20'W	1	G. Friedrichsen
25 Mar. 1983	16°32'N 105°43'W	1	G. Friedrichsen
29 Mar. 1983	11°22'N 109°25'W	1	J. Cotton
10 Apr. 1983	24°57'N 115°45'W (Alijos Rocks)	16	R. Pitman

*noon ship position

COOK'S PETREL (*Pterodroma cookii*). These petrels were abundant in the vicinity on 15 May 1982. An estimated 75 were foraging in association with a school of Common Dolphins (*Delphinus* sp.) ½ nautical mile north of the rocks. This species was noted during every survey and is a common resident off Baja during the boreal summer (Pitman unpubl. data).

SOOTY SHEARWATER (*Puffinus griseus*). One bird, 5 nautical miles north, and two others, ½ nautical mile north of the rocks, on 15 May 1982.

TOWNSEND'S SHEARWATER (*P. auricularis*). Identification of this shearwater is based on a sharply demarcated black and white color pattern, conspicuous white rump patches and fluttering flight. I saw one 5 nautical miles north of the rocks on 15 May 1982, which is as far north as this species has been known to range (Jehl 1982). Seven more were seen within 20 nautical miles south of Alijos Rocks on the same date. These birds were presumably part of a northward, post-breeding dispersal from nesting colonies on the Revillagigedo Islands.

BLACK-VENTED SHEARWATER (*P. opisthomelas*). A brownish "Manx-type" shearwater seen 46 nautical miles southeast of Alijos Rocks on 8 March 1979 was probably this species; two positively identified birds were circling in the immediate area of the rocks on 10 April 1983. Identifying characters included rapid wingbeat, brown upperparts and white below with a smudgy brown chest. This species typically requires soil for excavating nest burrows (Palmer 1962), but also nests in rock crevices (Jehl pers. obs.). Conceivably a few pair may breed on the soilless rocks of Alijos.

GALAPAGOS STORM-PETREL (*Oceanodroma tethys*). Murphy (1958) collected two of these petrels on 10 November 1956 at 22°57'N, 113°34'W, "a few miles N of the isolated Alijos Rocks" (actually 175 nautical miles southeast of Alijos). In November 1974 I saw two individuals 20 nautical miles north of the rocks and four others closer in.

LEACH'S STORM-PETREL (*O. leucorhoa*). This species has been common in the area during every visit. Murphy (1958) also found them common in the vicinity in November 1956.

On 15 May 1982, I observed at least three dark-rumped, medium-sized storm-petrels fluttering about South Rock in broad daylight (about 1400). They hovered within 10-15 cm of the cliff face at a height of up to 23 m above the sea surface and were apparently investigating nest sites. I presumed they were all Leach's Storm-Petrels. On 10 April 1983 I saw an all-dark Leach's Storm-Petrel fluttering about South Rock at 0800 while another flew from the rock out to sea.

If this species does nest here, it would be the southernmost location in the North Atlantic or the Pacific, although Imber and Lovegrove (1982) have reported a case of potential breeding off New Zealand. It also appears that the normally nocturnal Leach's Storm-Petrel has taken to visiting nest sites by day at Alijos Rocks, possibly owing to a lack of avian predators. Harris (1969) found a similar situation for Galapagos Storm-Petrels breeding in the Galapagos Islands.

BLACK STORM-PETREL (*O. melania*). Eight individuals were within 40 nautical miles of the rocks in November 1974.

RED-BILLED TROPICBIRD (*Phaethon aethereus*). Apparently this species is a year-round resident; I saw it on every trip to Alijos Rocks. Hanna (1926) saw tropicbirds in April 1925 on North Rock and presumed they were breeding. Brattstrom (pers. comm.) saw three in November 1953, and Murphy (1958) found them "in abundance" and courting in November 1956, when he collected a breeding male. I have observed roosting and nesting only on South Rock and suspect it may be the only rock where they are now breeding. The current population is about seven pairs. This is the

northernmost colony for this species in the eastern Pacific, outside the Gulf of California.

MASKED BOOBY (*Sula dactylatra*). Boobies are year-round residents. They were present on North and South rocks and were presumed breeding when Hanna (1926, McLellan 1926) and company collected an immature bird in April 1925. Brattstrom (pers. comm.) estimated 25 in May 1953 and Murphy (1958) found an unspecified number of young and adults associated with the colony in November 1956.

I estimated 30 of these boobies in February 1976 and Au (pers. comm.) reported "no more than 30" in December of that year. I estimated 30 again in May 1982 and 35 in January 1983. My largest count, however, was in April 1983, when 65 (including two large downy young) were present on North Rock and 15 (including one chick) were on South Rock. The majority of the booby activity is currently centered on North Rock, where most of the roosting and nesting take place. This rock is presumably the "easternmost of the three stacks" to which Murphy (1958) refers.

The Alijos Rocks breeding population is the northernmost in the eastern Pacific and consists of approximately 50 pairs.

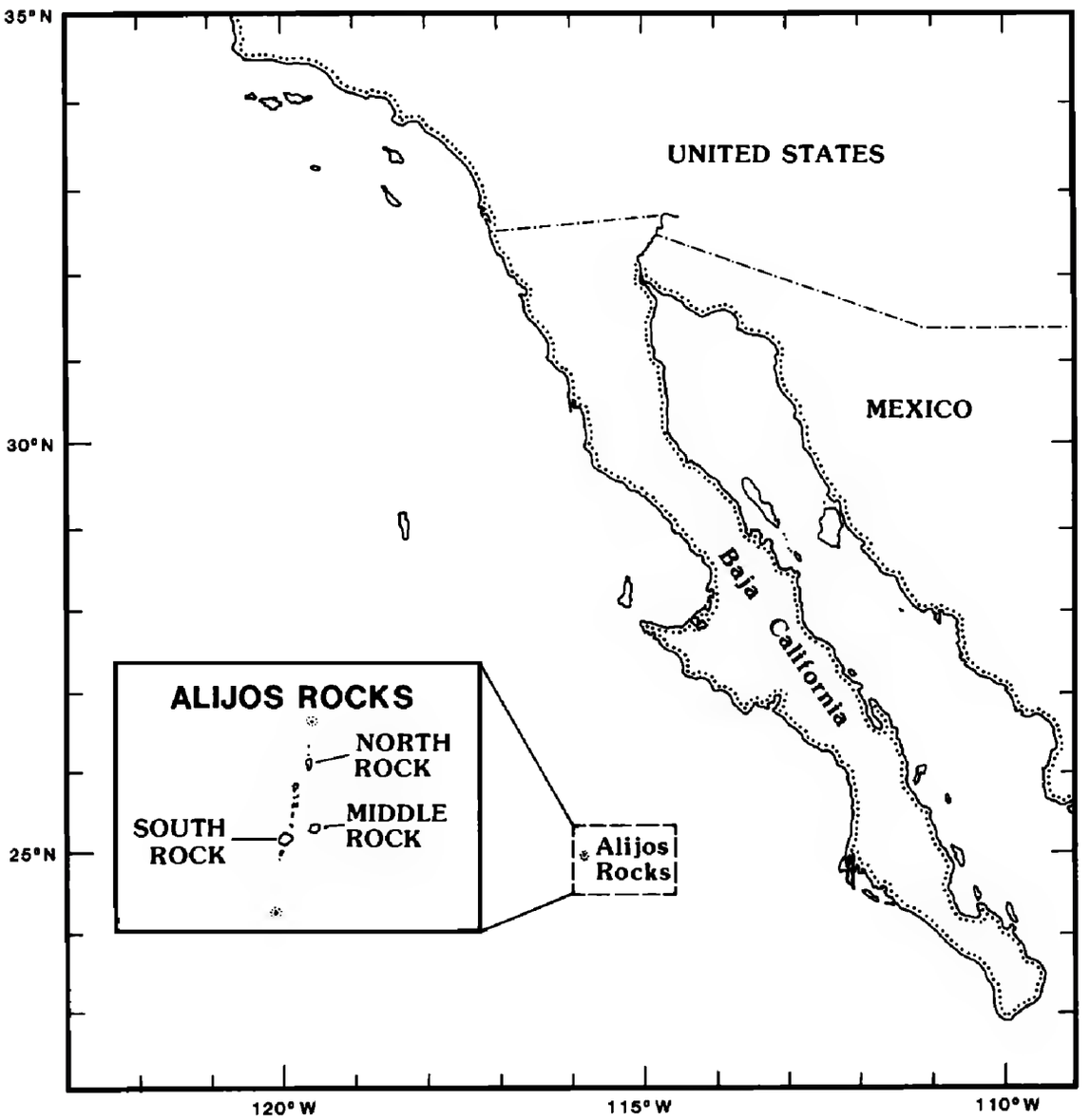

Figure 1. Alijos Rocks, Mexico, with inset showing individual rocks.

Figure 2. A relatively calm day at Alijos Rocks showing from left to right: Middle Rock. North Rock and South Rock (April 1983).

Figure 3. South Rock stands up on five legs and has daylight visible from almost any angle. Laysan Albatross can be seen flying to the right of the rock (April 1983).

CORMORANT (*Phalacrocorax* sp.). A single, large cormorant was roosting on the cliff faces in February 1976 and again in May 1982. Brandt's Cormorant (*P. penicilatus*) seems likely.

MAGNIFICENT FRIGATEBIRD (*Fregata magnificens*). Seven Magnificent Frigatebirds were present on 14 January 1983, five females and one juvenile being identified. I saw several roosting on Middle Rock, but none elsewhere. A single adult female was soaring above the rocks on 10 April 1983, but I saw no signs of nesting.

Away from the immediate area of Alijos Rocks, I saw an adult female *magnificens* and an unidentified frigatebird 80 nautical miles to the southeast in March 1979; later I observed six individual unidentified frigatebirds (probably *magnificens*) within 75 nautical miles of the area in January 1981.

It is not clear whether frigatebirds nest at Alijos Rocks. Hanna (1926, McLellan 1926) saw none in April 1925. Brattstrom (pers. comm.) reported 12 at the rocks in November 1953 though he apparently saw none in May 1953. Murphy (1958) collected two adult males in November 1956 and identified Alijos Rocks as the northernmost breeding colony for *magnificens* along the Pacific coast, but provided no evidence for breeding. My records suggest that Magnificent Frigatebirds are regular visitors to Alijos Rocks during the non-breeding season (winter) but probably do not breed there.

CATTLE EGRET (*Bubulcus ibis*). A flock of five joined the ship for a few minutes, 10 nautical miles east of the rocks on 16 November 1974.

RED PHALAROPE (*Phalaropus fulicarius*). An estimated 20 were close to the rocks and feeding in February 1976; small numbers were in the vicinity and moving north in April 1983.

Figure 4. Masked Boobies roosting on top of North Rock and Laysan Albatross circling in the background (April 1983).

POMARINE JAEGER (*Stercorarius pomarinus*). One was 15 nautical miles south of the rocks on 15 May 1982.

PARASITIC JAEGER (*S. parasiticus*). One was 3 nautical miles north on 14 January 1983.

HERRING GULL (*Larus argentatus*). Five (2 adults, 3 subadults) were among the gulls that stayed around the ship as we fished near the rocks in February 1976.

WESTERN GULL (*L. occidentalis*). Probably a regular visitor. One subadult was among the gulls present in February 1976; a third year bird was 20 nautical miles south of the rocks on 15 May 1982, and two adults joined the ship 35 nautical miles to the northeast on 10 April 1983.

CALIFORNIA GULL (*L. californicus*). One was with the other gulls present in February 1976.

LAUGHING GULL (*L. atricilla*). One juvenile, collected 16 November 1974, was 1.5 nautical miles from the rocks (SDNHM 39578).

BLACK-LEGGED KITTIWAKE (*Rissa tridactyla*). A minimum of 10 adults and juveniles hovered around the ship in February 1976. This is the only record for Alijos Rocks and is probably as far south as this species has been known to occur in the eastern Pacific. The winter of 1975-76 was a significant "flight year" for kittiwakes in the eastern Pacific (see also Northern Fulmar).

SOOTY TERN (*Sterna fuscata*). A summer breeder, probably absent at other seasons. I saw none on trips in November, January or February, nor did Brattstrom (pers. comm.) in November 1953 or Murphy (1958) in November 1956. McLellan (1926) and Hanna (1926) reported them on both South and East rocks in late February 1925 and collected nine. Brattstrom (pers. comm.) estimated 100 "roosting, apparently nesting" in May 1953.

On 15 May 1982 I estimated a minimum of 200 terns on top of South Rock; they were evenly spaced and probably nesting. Also, I saw four more foraging ½ nautical mile to the north. On 10 April 1983 approximately 10 were flying around the rocks but none was on shore. There are very few nesting colonies of Sooty Terns in the eastern Pacific, and the Alijos Rocks colony is the northernmost, with a population of about 250 individuals.

ZOOGEOGRAPHY

As is evident from some of the comments in the species accounts, Alijos Rocks is situated at the border of two very distinct oceanographic areas. Cool, southward flowing waters of the California Current meet warm tropical waters of southern Baja California at about 25°N and then veer to the southwest to form the southeast corner of the North Pacific Gyre (Wyrtki 1966).

South-central Baja is therefore an important boundary zone for tropical and cooler water species of marine birds, mammals and fishes (Hubbs 1960), as well as euphausiids (Brinton 1962) and other epipelagic organisms (McGowan 1968). Dawson (1960) sampled marine algae at Alijos Rocks and found southern records for three northern types along with "a high proportion of tropical species."

Currently four species of marine birds nest at Alijos Rocks. Leach's Storm-Petrel (a presumed breeder) nests in more temperate waters around the North Pacific basin and has its southernmost breeding station at Alijos. The

Figure 5. Middle Rock with roosting frigatebirds; California Sea Lions (*Zalophus californianus*) are hauled out in the foreground. A group of four albatrosses is on the water at the lower left (January 1983).

Photos by the author

remaining species (Masked Booby, Red-billed Tropicbird and Sooty Tern) all inhabit tropical or subtropical waters and have their northernmost breeding colony in the eastern Pacific at Alijos. The bird fauna of Alijos Rocks, then, also reflects the transitional nature of the local ocean environment.

On most of my visits to Alijos Rocks the thunderous splashes produced by swells slamming into the vertical pinnacles have been visible from many miles (see also Hanna 1926:28). Despite this relentless onslaught the three main spires appear to have remained largely unchanged since they were first illustrated nearly 150 years ago (Figure 6), or photographed almost 60 years ago (Hanna 1926). South Rock, severely undermined through wave action, is still precariously perched on five legs as it was in 1925 when Hanna (1926) described it. A recent fourth pinnacle, however, has not survived. Rudkin's (1956:100) reproduction of a drawing made on a French survey in 1837 (Figure 6) shows a fourth rock (second from right; also mentioned in his text, p. 94-95) that is about half the size of Middle Rock. This site no longer exists. The remaining stacks at Alijos Rocks will probably topple in time and several species of marine birds will forfeit a toehold at the edge of their ranges in the eastern Pacific.

SUMMARY

The breeding marine avifauna of Alijos Rocks, Mexico (24°57'N, 115°45'W), currently consists of Leach's Storm-Petrel (a presumed breeder; probably a few pairs), Red-billed Tropicbird (14 birds), Masked Booby (100), and Sooty Tern (250). Magnificent Frigatebird is a regular winter visitor but probably does not breed. Laysan Albatross is currently an annual visitor to Alijos Rocks during its winter breeding season, and may start to nest there in the near future.

ACKNOWLEDGMENTS

A number of people have been very helpful in conducting these surveys and I would particularly like to thank Jim Cotton and Gary Friedrichsen, as well as the indulgent ship captains and chief scientists who made this report possible. Dave Au and Bayard Brattstrom kindly made their unpublished field notes available to me, and Glen Dawson, Los Angeles, granted me permission to reproduce Figure 6. I am especially indebted to Joseph R. Jehl, Jr., for first taking me to Alijos Rocks, then for commenting on an earlier version of this paper.

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Figure 6 Aljos Rocks from an 1837 engraving, notice the birds hovering above the pinnacles (from Abel Du Petit-Thouars' *Voyage of the Venus*, courtesy Glen Dawson)

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Accepted 14 March 1985

NOTES

TWO-YEAR OLD FEMALE SPOTTED OWL BREEDS SUCCESSFULLY

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To understand the population dynamics of a species it is necessary to know age at first breeding and frequency of breeding by age class (Caughley 1977). Despite intensive studies of the Spotted Owl (*Strix occidentalis*) in Oregon, California and Washington during the last decade (Allen and Brewer 1985, Barrows 1981, Barrows and Barrows 1978, Forsman et al. 1984, Solis 1983), no one has been able to determine the age at which Spotted Owls become reproductively mature. In June 1984 we observed a 2-year-old female which bred successfully and, at the same time, a similar event was observed in California (Barrows 1985). This paper provides detailed documentation of successful nesting by a 2-year-old Spotted Owl in Oregon.

Spotted Owls retain their Basic I white-tipped rectrices for 26 months after hatching (Forsman 1981). Birds less than 26 months old are readily distinguished from older owls, which have mottled tips on the rectrices. On 3 May 1984, we found a female Spotted Owl with Basic I rectrices 23.2 km SSE of Cottage Grove, Lane County, Oregon. The same female was again observed on 27 June 1984, roosting with a recently fledged young. Three more trips to the nest area during the next 3 weeks revealed the female roosting consistently with the young and an adult male. The tips of the male's rectrices were well rounded and mottled, indicating it was at least 3 years old. Several food transfers between the female and fledgling were observed.

On 22 July 1984, we captured both the fledgling and female with a noose pole and fitted them with radio transmitters. Even though we closely examined the female's rectrices while attaching the transmitter, age could only be determined as less than 26 months (wear on Basic I rectrices is variable and not a good indicator of exact age). On subsequent visits we observed that the female lost all of her Basic I rectrices between 1 and 12 August (a nearly simultaneous molt). The developing Basic II rectrices could be seen protruding slightly beyond the tail coverts on 30 August. The molt of the rectrices established that the female was 2 years old during the 1984 nesting season. Although the above observations indicate that Spotted Owls are capable of breeding successfully at at least 2 years of age, this phenomenon appears to be rare. It is still unknown whether the majority of Spotted Owls first breed at 3, 4 or more years of age.

ACKNOWLEDGMENTS

We would like to thank Ruth Brandt, Eric Forsman, Richard Frenzel and E. Charles Meslow for reviewing early drafts of this manuscript. Their comments added greatly to the paper. Cameron Barrows also reviewed the paper and provided us with an additional observation. Information in this paper was gathered while conducting a juvenile dispersal project on Spotted Owls. Funding for this project was provided by the Old Growth Forest Wildlife Habitat Program (Contribution 38), U.S. Forest Service, Pacific Northwest Forest and Range Experiment Station, Olympia, Washington. This is Oregon State University Agricultural Experiment Station Technical Paper 7532.

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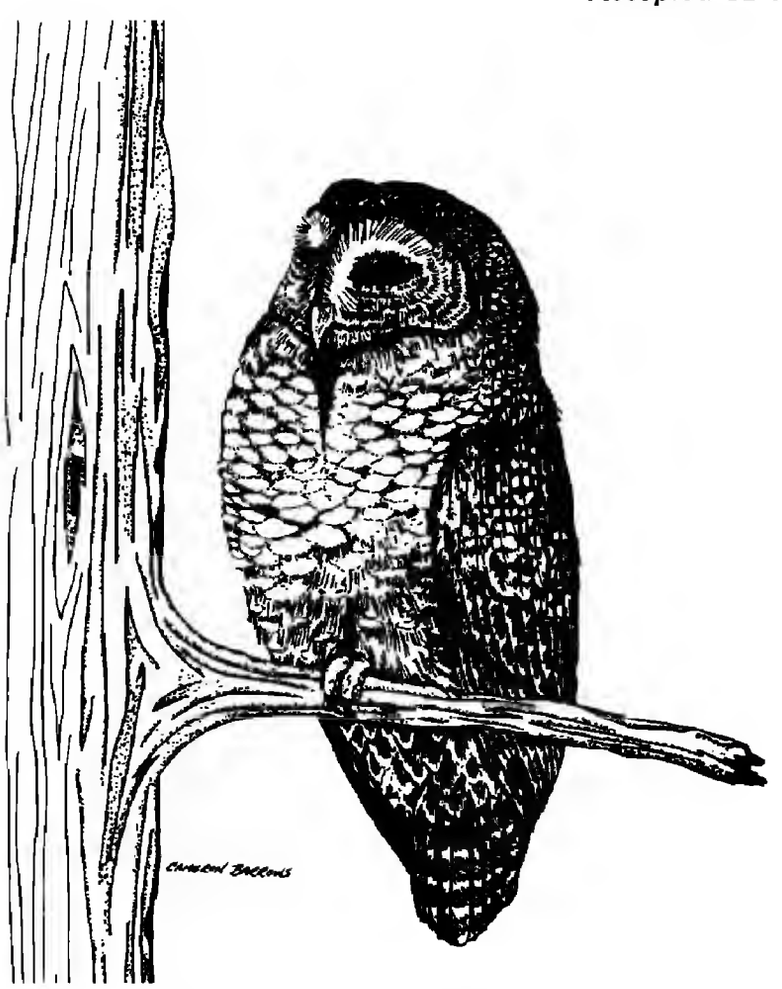

Spotted Owl *Sketch by Cameron Barrows*

FIRST RECORD OF THE YELLOW-THROATED WARBLER IN WYOMING

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On 25 May 1983 I made in Laramie, Albany County, the first reported observation in Wyoming of a Yellow-throated Warbler (*Dendroica dominica*). Laramie is in a grassland basin at 2194 m (7200 ft) elevation and is a treed residential area. Sightings of this bird (Figure 1) were frequent from 25 May 1983 through 27 May 1983.

I obtained the following description with 7x binoculars: yellow throat and upper breast; white abdomen; black streaking over white on sides; black auricular; bottom of white eye stripe touching top of eye; white patches on either side of the neck just posterior to the auricular; gray back without spots; dark gray crown; and white wing bars. Additional notes from color 35mm slides include a straight black bill and pale pink legs and feet.

The bird was foraging mostly in deciduous trees (Plains Cottonwood, *Populus sargentii*, and American Elm, *Ulmus americanus*) in the bud stage, although it did visit nearby Blue Spruce (*Picea pungens*) trees. Commonly, it gleaned food (presumably insects) from branches and the underside of developing leaves. Between foraging attempts the bird hopped about with occasional short flights to other branches. Observed foraging attempts varied in height from 3 m (10 ft) to 14 m (46 ft). My original notes contain no reference to any vocalizations, nor do I recall any.

Figure 1. Yellow-throated Warbler (*Dendroica dominica*), Laramie, Albany Co., Wyoming, 25-27 May 1983. The color 35 mm slide from which this print was made shows bright yellow extending from the chin down to and including the upper breast. A complete description is in the text.

Photo by Craig D. Thompson

Table 1. Recent records of the Yellow-throated Warbler (*Dendroica dominica*) in Wyoming and surrounding states.[1]

	Spring Records			Fall Records			
State	Number	Earliest	Latest	Number	Earliest	Latest	Source
Colorado	13	3 Apr.	2 Jun.	1	7 Dec.	8 Dec.	Colorado Official Records Committee
Idaho	0	—	—	0	—	—	Charles Trost, Univ. of Idaho
Montana	0	—	—	1	19 Dec.[2]	4 Jan.	Faanes 1982
Nebraska	21	11 Apr.	2 Jun.	4	14 Jul.	1 Oct.	Johnsgard 1980
S. Dakota	2	19 Apr.	23 Apr.	0	—	—	Harrell et al. 1978
Utah	1	19 May	19 May	0	—	—	Behle and Perry 1975
Wyoming	1	25 May	27 May	0	—	—	This note

[1]Table complete through fall 1984 to best of author's knowledge.
[2]Reported from late October, but first confirmed 19 Dec. (H. Carlson pers. comm.)

The American Ornithologists' Union (1983) describes the Yellow-throated Warbler as accidental north to Montana and present in migration "rarely west to Colorado and New Mexico, casually to southern Arizona and California." Table 1 is a summary of known records in Wyoming and the surrounding states. The obvious and expected trend is a greater number of observations in the area to the south and east, which is closest to the species' normal range. The relatively high number of Colorado observations may be partially attributed to high observer density, as most Colorado observations are along the Front Range. Another obvious trend is that most observations (86%) are in the spring. Most unusual is the very late (late October 1981 through 4 January 1982) and northwesterly observation in Billings, Montana.

ACKNOWLEDGMENTS

Keith Dueholm, Debbie Finch, David Mozurkewich, Cathy Raley and Craig Thompson immediately responded to my call to verify this sighting. Craig Thompson photographed the bird. Alan Craig, Robert Oakleaf and Oliver Scott made useful comments on the draft manuscript. I especially thank the following people for assisting me by locating records of the Yellow-throated Warbler from their respective states: Charles Chase, III, and Peter Gent, Colorado; Charles Trost, Idaho; Helen Carlson, Montana; John Dinan, Nebraska; Lester Flake and Nelda Holden, South Dakota; Ella Sorenson, Utah; and Robert Oakleaf, Wyoming.

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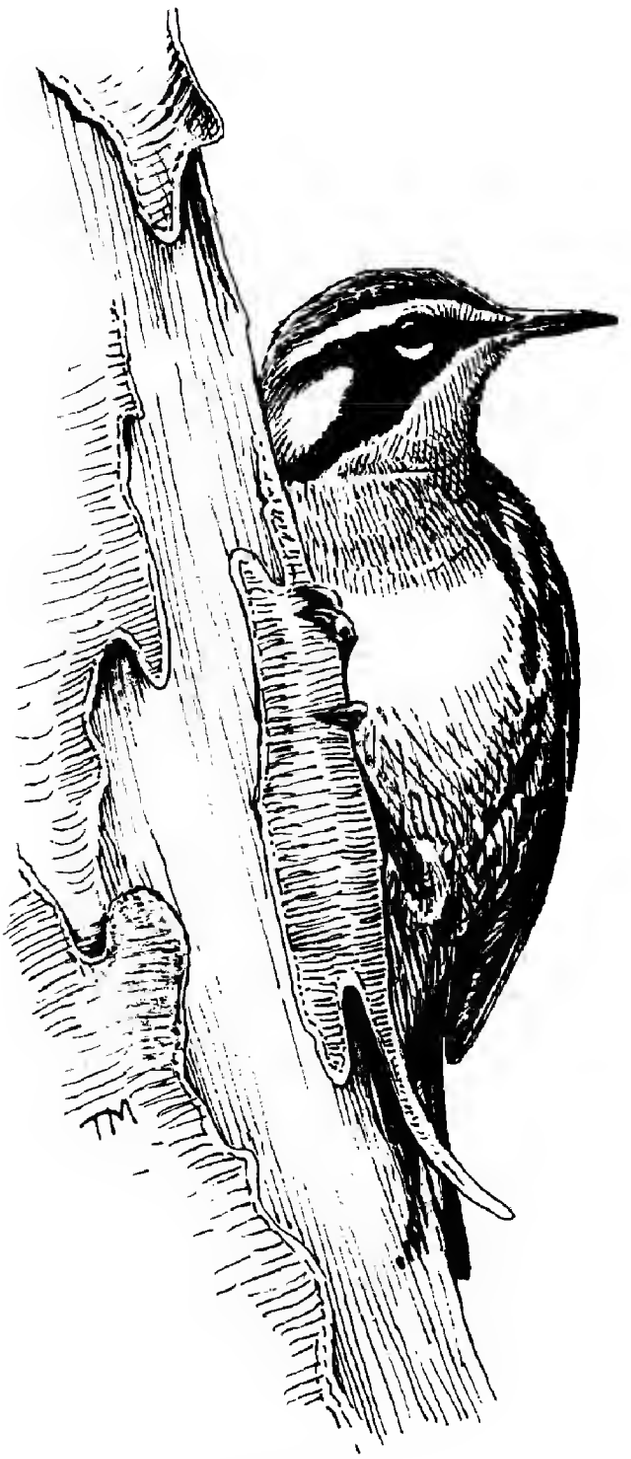

Yellow-throated Warbler

Sketch by Tim Manolis

NESTING DOVES AND THRASHERS SHARE CLOSE QUARTERS

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A pair of Mourning Doves (*Zenaida macroura*) and a pair of Curve-billed Thrashers (*Toxostoma curvirostre*) built their nests in the same 1.8 m Jumping Cholla (*Opuntia fulgida*) in a dry wash near River Rd., Tucson, Arizona, in May 1983. Unfortunately we have no observations of their behavioral interactions, but the doves were apparently there first and had two eggs in an advanced stage of incubation when the thrashers moved in, building up an old thrasher nest and depositing three eggs about 15 May just 0.5 m below the doves. Thus on 27 May when we found them, the doves' brood was about 8 days old and the thrashers were sitting on eggs. When we returned on 8 June both pairs were still in residence; the doves had fledged their brood and were now sitting on two new eggs while the thrashers downstairs were busily tending the young that had hatched during our absence.

Two other instances in which doves and thrashers nested as close neighbors were found in this same 75-ha area in 1983, but in both cases the doves fared less well. In one of these the doves built and laid on 20-22 February on a low Littleleaf Palo Verde (*Cercidium microphyllum*) branch just 1 m from and slightly higher than a bulky, 1.3 m high cholla-supported thrasher nest containing three eggs. The dove eggs hatched 6-7 March, and 2 days later their nest was empty and abandoned. The young thrashers were by that time nearly ready to fledge, and whether or not their parents played some role in the demise of the doves we will never know. In any event the doves, or at least a pair of doves, were back and incubating eggs on 14 April when the thrashers were gone.

In the other case both nests were in a 1.8 m Jumping Cholla, the doves 0.3 m higher and 0.9 m away from the bulky thrasher structure. Birds were flushed from both nests on 10 February, but thereafter the doves were not seen for over a month, while the thrashers laid eggs and raised a brood that fledged about 24 March. Meantime the doves had returned and were incubating two eggs on 22 March, having reoccupied their old nest while the young thrashers were still present. Predators destroyed this clutch 10 days later before hatching occurred, and a few days later the thrashers were back with a new clutch of eggs in their nest. Again we wondered whether the thrashers were guilty, but the evidence was limited to the chronology of events.

With an apparent abundance of good nesting sites we wonder why doves should, on occasion, choose to build as close to thrashers as they did in two of the instances described. Thrashers, on the other hand, may be pressed by a shortage of adequate sites and forced to share when sites are already occupied as in the first case.

Accepted 7 February 1985

HORNED PUFFIN SIGHTINGS IN THE EASTERN PACIFIC

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On 3 July 1979, while conducting a survey of marine bird colonies of coastal Oregon for the U.S. Fish and Wildlife Service, we saw a single Horned Puffin (*Fratercula corniculata*) roosting on Island Rock, approximately 8 km south of Port Orford, Oregon. The bird (Figure 1) was an adult in summer plumage. It roosted on a rocky outcropping 40 m above the sea surface on the east side of the island, near the south end. During the next 2 hours, while we censused nesting birds on the island from a boat, it disappeared into a crevice for up to 30 minutes at a time. Twice while we watched, it flew from its roost and circled widely around the colony several times before returning to its original site. We climbed up and inspected the crevice but were unable to determine if it was being used for nesting. As Campbell et al. (1979) pointed out, the behaviors we observed are also the activities of scouting pre-breeders and we have not inferred that this was an actual breeding attempt. At the time of our sighting, Island Rock had a population of approximately 350 Tufted Puffins (*F. cirrhata*).

On 4 August 1984, while conducting research on Hunters Island, Oregon, Graybill observed a single Horned Puffin in summer plumage circling above the island with 13 Tufted Puffins. Presumably it had been flushed from the island with the other puffins when Graybill went ashore. During the next 20 minutes it made repeated passes at the island at an altitude of less than 3 m but was never seen to land. Hunters Island is approximately 20 km south of Gold Beach, Oregon; an estimated 10 pairs of Tufted Puffins were nesting on the island at the time of the sighting.

Campbell et al. (1979) recently found Horned Puffins breeding in southern British Columbia. Their report was the first record of nesting for this species south of Alaska. Though they found only a few pairs, making it possible that the puffins were only overlooked in the past, Campbell et al. (loc. cit.) cautiously implied that some real range expansion may have been taking place. Thoresen (1981) reported a single Horned Puffin with a group of Tufted Puffins near a potential nesting colony in Rosario Strait, Washington, in July 1977, but the bird was never actually seen to land on the colony.

Since around 1970, Horned Puffins have been regularly seen off Oregon in small numbers during the summer months (e.g. Crowell and Nehls 1970, 1975, 1977; Hunn and Mattocks 1977). The only previous record of Horned Puffin roosting at a potential nesting site in the western United States outside of Alaska was from Yaquina Head, Oregon, 260 km north of Island Rock, where a single individual was seen on two consecutive days in June 1973 (Hoffman et al. 1975). Ramsey (1975), noting the change in the number and seasonal occurrence of Horned Puffins in Oregon, asked "Could it be that this species actually nests on the Oregon coast?"

Hoffman et al. (1975) reviewed the status of Horned Puffin in the eastern Pacific following 1973, when an inordinate number were recorded off the western United States. They reported that around the mid-1950s this species changed from a predominately wintering bird to a spring and early summer visitor. They suggested that possibly a long term change in the oceanic environment was causing a shift in seasonal occurrence as well as an increase in abundance of Horned Puffins in the eastern Pacific.

This suggestion of a change in seasonality and increased occurrence was given some support by the extensive seabird surveys conducted off California by the Univer-

sity of California for the Bureau of Land Management and Minerals Management Service. During regular, year-round ship and aerial surveys from 1975 to 1977, Briggs et al. (1978) recorded 108 Horned Puffins off southern California, all in the months of April, May and June. Hoffman et al. (1975) found records of only five Horned Puffins from southern California prior to 1974.

During 1980-83, Briggs et al. (1983) conducted regular aerial surveys of marine birds off northern California (Point Conception to the California/Oregon border). They found low numbers of Horned Puffins (up to seven in February 1980) from February through May; most of these were "well offshore." Single birds were sighted over the continental slope in August 1980 and November 1982, but none were seen during other months. Briggs et al. (loc. cit.) identified only 24 Horned Puffins during the northern California study but alcids are difficult to distinguish from the air. Also, their aerial surveys normally ranged only out to 200 km from shore during most of the study (and occasionally out to 350-400 km during 1982); this distance may not have been far enough offshore to sample this species adequately (see below).

On 17 February 1984, Pitman was surveying seabirds en route from San Francisco, California, to Honolulu, Hawaii, aboard the NOAA ship Discoverer using 25 power mounted spotting binoculars. During 6.5 hours of observation in Beaufort 4 sea conditions he saw 54 Horned Puffins. These birds were observed only during the last 3.5 hours of survey as the ship traveled from 185 to 260 km (100-140 nm) due W of San Francisco. Puffins became increasingly common until dusk when the survey was terminated, with 20 seen during the last half hour. During the last 2 hours of that survey, Horned Puffin was the second most abundant species, out-numbered only by Red Phalarope (*Phalaropus fulicarius*). At that time puffins were mostly seen either sitting on the water or flying away from the ship. None were seen the next morning when the ship was 726 km (392 nautical miles) from San Francisco, nor were any seen the rest of the way to Hawaii.

On the return trip from Hawaii to Seattle, Washington, in May 1984, Horned Puffins were once again abundant in the offshore zone. On 7 May during 7 hours of observation in Beaufort 5 sea conditions, Pitman counted 165 puffins. It was the most abundant species present as the ship traveled NE from 815 to 630 km (440-340 nm) off Cape Blanco, Oregon. Almost every bird seen was flying WNW, apparently heading to breeding grounds farther north.

On the following day, 8 May, the ship continued NE, traveling from 315 to 31 km (170-17 nm) off Cape Flattery, Washington. During 8 hours of observation only four puffins were seen though sighting conditions were improved (Beaufort 3-4). None of these puffins were within 185 km (100 nm) of the coast. Interestingly, no Horned Puffin records were included in the regional reports of *American Birds* from the western United States for the winter, spring or summer of 1984 (G. McCaskie and R. LeValley pers. comm.), though puffins were apparently abundant offshore.

Table 1. Records of Horned Puffins (*Fratercula corniculata*) off the western United States, south of Canada, from the regional reports of *American Birds*, 1974-1984 (n = 369; not included below are 5 puffins from months other than those listed and 3 described as long dead).

	summer: May-Aug.	winter: Dec.-Mar.
alive	324	6
dead	4	27

Since 1974, when Hoffmann et al. (1975) last summarized available records, 369 Horned Puffins have been reported off the western United States, south of Canada, in the regional reports of *American Birds* (Table 1). Winter records are sparce and usually involve dead birds on the beach. Three of the six live winter birds were 130-140 km off the coast of Washington. In contrast, summer records were almost all of live, healthy birds, often near islands or inshore areas, and usually seen during the months of May or June.

From the evidence above we suspect that Horned Puffin may be a regular and, at least sometimes, abundant visitor to the offshore waters of western North America, ranging as far south as central or southern California during the winter (see also Ainley 1976, McCaskie 1976). In May and June 1975, when an unprecedented number of Horned Puffins were reported off California, they were found as far south as northern Baja California (Punta Banda), Mexico (McCaskie 1975).

Under normal conditions, Horned Puffins probably only rarely stray onto the waters of the continental shelf during winter. In late spring/early summer, with the onset of northwesterly winds, upwelled, nutrient-rich water causes an annual peak in plankton production in the California Current (Bolin and Abbott 1963). This period of increased productivity coincides with a peak in observations of Horned Puffins off the west coast. During normal years, most wintering puffins presumably depart offshore waters and head north to summering grounds without being noticed. In other years, however, some Horned Puffins appear to move in closer to the coast just prior to their northward migration, accounting for the preponderance of May/June records.

There appears to be an increased occurrence of Horned Puffins remaining behind to spend the summer and occasionally visit roosting sites in the southern extent of their eastern range. Whether this is indicative of annual oceanographic anomolies, a longer

Figure 1. Horned Puffin roosting at a crevice entrance on Island Rock, Oregon, 3 July 1979.

Photo by Michael R. Graybill

term cycle that may ultimately affect their breeding range, or some other factors (e.g. a burgeoning population), is unknown. What is known is that the apparent change in status for this species closely parallels the development of increased public interest in recreational seabird watching and the advent of detailed seabird resource assessments (e.g. at-sea surveys, colony inventories, beached-bird salvaging programs). So it may also be that most of the records discussed above, including our own, are only the result of closer scrutiny by field investigators.

We would like to thank Ken Briggs and Harry Nehls for comments on an earlier draft of this paper.

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Accepted 2 April 1985

REVIEWS

Checklist of the Birds of Texas, 2nd edition. Texas Ornithological Society. 1984. 147 pp. Order from TOS, c/o Keith Arnold, Dept. Wildl. & Fish. Sci., Texas A & M University, College Station, TX 77843. $3.75 for members, $4.75 for others; please add 75¢ for mailing, and 19¢ or 23¢ sales tax for Texas residents.

The basic ornithological source for Texas is the two volume set *The Bird Life of Texas* by Harry C. Oberholser, updated and edited by E.B. Kincaid, Jr., S. Winckler and J.L. Rowlett (University of Texas Press, 1974). With over 1000 pp. of detailed information and some beautiful plates by Louis Agassiz Fuertes, that work will remain a classic. But with a price tag of around $100 for the set, those wishing to learn much about the distribution of birds in Texas will find this checklist a handy and up-to-date alternative at 1/20 the cost.

The Bird Records Committee of the Texas Ornithological Society accepts documentation for 555 species from the state. With that many species to cover, entries are somewhat limited. For each species there is a paragraph covering numerical and seasonal status for the state, giving reference to biogeographical regions or man-made zones (e.g. counties) when needed. Specimens and photographs are noted for the scarcer species. For polytypic species, a brief summary is given for each race.

If space is to be a limit, and it usually must be, some sacrifices will be made. The most obvious is the lack of information on the timing of migration. For example, in the warbler accounts there is no indication which are early or late migrants in spring. And relatively few distinctions are made between spring and fall migration; I would have thought that Blackpoll was more numerous in spring than in fall. Of course generalizations about timing are difficult in such a large state, but something more would be welcome in the next edition.

On the other side of the coin, bonus points are to be awarded for the attention paid to the distribution of different races in the state. Although the information is necessarily brief, and the criteria and authority for the separation of forms not given, there is much to be learned from the general outline presented, and it is to be hoped that this feature will be maintained and refined in the future.

The checklist is careful to present sources of documentation for the less numerous species. Although some may wish this documentation for the true accidentals, for other species the space seems unwarranted. Jaegers are not always easy to identify, but if Pomarine is "rare to uncommon," then there is no need to take up seven lines with documentation. And for the easily identified Sabine's Gull, nine lines to cover six documented records seems superfluous.

The recommendation: buy it. Those owning Oberholser will value the perspectives of these authors and will appreciate the most recent decade of discovery that has been included. Those with little about Texas birdlife on the bookshelf will find this a handy introduction and reference.

Hawaii's Birds, 3rd edition, revised. Shallenberger, Robert J., ed. 1984. Hawaii Audubon Society. 96 pp. Order from Hawaii Audubon Society, P.O. Box 22832, Honolulu, HI 96822; $4.95 plus 72¢ (surface mail) or $1.03 (air mail).

This attractive booklet serves as a good introduction to the birdlife of Hawaii. Those wishing more information will find the "Selected References" section of this booklet useful; particularly important is *Hawaiian Birdlife* (2nd edition) by Andrew J. Berger (The University Press of Hawaii, 1981).

All of the most regularly occurring species are given about a half page of text, divided into sections on Distribution, Description, Voice and Habits. With most sections containing five or fewer lines, there is little in the way of detailed information, but, given the limited avifauna and geographical scope, it should be sufficient for most pur-

poses. A concluding checklist of the endemic birds listed by island gives further indications of status. Scarce or accidental migrants and scarce introduced birds are also given sections in the back.

Attractive illustrations are the strong point of this work. Most species are shown in crisp, clear, well-reproduced color photographs; especially pleasing are the tropical seabirds. Other species, particularly landbirds, are illustrated with paintings, ranging from some relatively new, striking ones by H.D. Pratt to reproductions from 19th century works. Although the booklet is only 5" x 7", the illustrations are able to command attention despite their small size.

Four pages in the rear are devoted to maps of the main islands with brief suggestions for birding localities. The information in this edition is terribly brief; one hopes that a few more pages can be found in the subsequent edition to give a bit more idea of what can be found just where.

Owners of previous printings and editions of *Hawaii's Birds* will probably not wish to acquire this latest issue unless they are actually going there. For those who do not own one, 150,000 past buyers can't all be wrong.

The Joy of Birding. A Guide to Better Birdwatching. Bernstein, Chuck. 1984. Capra Press, P.O. Box 2068, Santa Barbara, CA 93120. 202 pp., soft cover. $8.95.

The Joy of Birding is drawn from Chuck Bernstein's columns in *Bird Watcher's Digest*. The 22 chapters represent a smorgasbord of birding experiences and lore, but in displaying such a variety the author has created a strain between the main title, "The Joy of Birding," and the subtitle, "A Guide to Better Birdwatching." A stronger emphasis on either the adventure or the teaching might have led to a more unified book.

Bernstein certainly makes many points which most birdwatchers will find instructive. His chapters include discussions of such important topics as writing descriptions, keeping field notes, studying distribution, and learning about molt. But while his essays provide introductions to techniques beginning birders will wish to learn, they do little more than whet the appetite.

I was also unhappy with the content of some of the lessons. While races of some species are identifiable with fair confidence in the field, I feel the subject appears too easy in Bernstein's discussions. For instance, I would guess that the grayer Orange-crowned Warblers (p. 129) might be *orestera*, not nominate *celata;* still, noting the details is well worth the effort. The color phases of Western Grebe are not races (p. 139). A comment (p. 122) about a possibly red-phased female Summer Tanager sounds like something out of H.C. Oberholser's *The Bird Life of Texas;* such birds do, apparently, exist, but if such a subject is going to be introduced, then it needs more thorough discussion (just what percentage of females are red-phased?). And while the first chapter has some valuable comments, the heading "Leave Those Field Guides at Home: Birding British Style" makes me wince.

This volume also seems to be part of a trend: as birding becomes more sophisticated, the language becomes less so. I, for one, will utter a plea that such contractions and reductions as "immy," "juvy," "bins" and "Savvies" not become a permanent part of our lexicon.

There are, appropriately, pockets of "Joy" in this book. They can be found in the tales of birding adventure and the anecdotes about birders. Read about Pinto, the dog with the huge state list. The excitement of the account of the Eared Trogon left me with regrets that I had not chased the bird. Mark these passages and show them to your friends who don't understand birdwatching—they may gain some feeling for the pleasure we get.

RICHARD WEBSTER, P.O. Box 6318, San Diego, California 92106

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Cover photo by Bruce Webb: Western Grebe (*Aechmophorus occidentalis*), Santa Barbara, California, 4 February 1982.

Manuscripts should be sent to Alan M. Craig, P.O. Box 254, Lakeview, CA 92353. For matters of style consult *Suggestions to Contributors to Western Birds* (6 pp. mimeo available at no cost from the Editor) and *Council of Biology Editors Style Manual* 4th edition, 1978 (available from the American Institute of Biological Sciences, 1401 Wilson Boulevard, Arlington, VA 22209 for $12.00).

Papers are desired that are based upon field studies of birds, that are both understandable and useful to amateurs, and that make a significant contribution to scientific literature. Appropriate topics include distribution, migration, status, behavior, ecology, population dynamics, habitat requirements, the effects of pollution, the techniques for identifying, censusing, sound recording and photographing birds in the field. Papers of general interest will be considered regardless of their geographic origin, but particularly desired are papers dealing with studies accomplished in or bearing on Rocky Mountain states and provinces westward, including Alaska and Hawaii, adjacent portions of the Pacific Ocean and Mexico, and western Texas.

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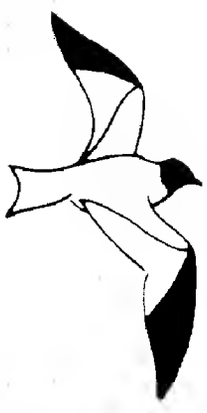
Good photographs of rare and unusual birds, unaccompanied by an article but with caption including species, date, locality and other pertinent information, are wanted for publication in *Western Birds*. Submit photos and captions to Photo Editor.



WESTERN BIRDS

Vol. 16, No. 3, 1985

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Published February 28, 1986

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WESTERN BIRDS

Volume 16, Number 3, 1985

EIGHTH REPORT OF THE CALIFORNIA BIRD RECORDS COMMITTEE

JOSEPH MORLAN, 417 Talbot Avenue, Albany, California 94706

This report contains 154 records of 63 species, documented by 109 contributors. Only 18 records are unaccepted, for an acceptance rate of 88.4%, the highest since 1975. Particularly encouraging is the high number of contributors. In fact, the ratio of total contributors to total records is 0.71, the highest since the committee began. This ratio, I believe, reflects a realization on the part of many birders of the value and importance of participating in the committee review process.

Nevertheless, we have not always been successful in obtaining all the evidence we would like. This report cites several cases in which photographs have not been submitted. In these cases, the record has been judged only on written descriptions. Photographers or curators who have rare bird photographs from California are urged to submit copies for our files. This practice will greatly aid us in our primary function, that of providing a central data base of rare bird records. All records are ultimately housed at the Western Foundation of Vertebrate Zoology, where they are available for further study. Sound recordings are housed at the California Academy of Sciences, Department of Ornithology and Mammalogy.

State list. This report officially adds five species to the California state list: Steller's Eider, Spotted Redshank, Sooty Tern, White-collared Swift and Yellow Wagtail. These additions bring the state list to 548 species. I extended the state list analysis of Jehl (1980) by adding the 17 species and deleting the 2 species officially treated since his study. The reanalysis reveals that the growth of the California state list has continued at the identical rate of 4.0 species per year through mid-1983. Of the species added since Jehl's study, 17% were North American, 17% Mexican, 58% Arctic/Asian and 8% pelagic. These percentages compare to Jehl's predictions of 31% North American, 12% Mexican, 42% Arctic/Asian and 15% pelagic.

Format. The format is similar to past reports with several changes. The Committee's record number follows the initials of contributors. Each locality is followed by an abbreviation for the county and the date. Species marked with an asterisk (*) are no longer being reviewed. Information on age and sex has been included when unambiguous. Plumage and molt terminology

follows that suggested by Amadon (1966). All records are sight records unless stated otherwise. If the person or persons who found or first identified the bird submitted details, their initials are given first, followed by a semicolon.

I have attempted to provide a full span of dates for each record. This information has kindly been provided by committee members. In most cases these dates are the same as published in the seasonal reports of *American Birds*. In cases where our dates differ from those, I have italicized our date, indicating that I believe it is correct. Previously unpublished records are annotated as such. Citations of previously published photographs are also given.

All annotations are mine, although most of the information comes from committee files. The purposes of the annotations are to provide the reader with an understanding of the reasons for some committee decisions, to supply additional information about the records, and to refer the reader to recent publications treating identification. Most of these articles were published since the major survey by Roberson (1980). In a few cases identification tips have been included directly in the annotations. Attempts to correct factual errors in previous publications have also been included.

Abbreviations. *American Birds* and *Audubon Field Notes* are abbreviated *AB* and *AFN* respectively. County abbreviations follow Garrett and Dunn (1981) for southern California and Roberson (1980) for northern California as follows: ALA Alameda, BUT Butte, CC Contra Costa, DN Del Norte, HMB Humboldt, IMP Imperial, INY Inyo, KRN Kern, LAS Lassen, LA Los Angeles, MRN Marin, MRP Mariposa, MOD Modoc, MNO Mono, MNT Monterey, ORA Orange, RIV Riverside, SBE San Bernardino, SD San Diego, SBA Santa Barbara, SJ San Joaquin, SLO San Luis Obispo, SM San Mateo, SCL Santa Clara, SCZ Santa Cruz, SIS Siskiyou, SON Sonoma, TRN Trinity, VEN Ventura.

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Acknowledgments. The committee greatly appreciates the critical reviews of records by the following consultants: Bruce Elliott, Peter J. Grant, R.F. Porter, J.T.R. Sharrock, Peter Harrison and J.V. Remsen. I gratefully acknowledge the help of the current members of the California Bird Records Committee in reviewing this paper and providing valuable data: Laurence C. Binford (Vice-Secretary), Jon L. Dunn, Richard A. Erickson, Kimball L. Garrett, Paul Lehman, Guy McCaskie, B.D. Parmeter (Secretary), Don Roberson and Richard E. Webster. Ron LeValley and Kurt F. Campbell also reviewed the manuscript and provided valuable comments. The following former members voted on some or all of the records in this report: H. Lee Jones, John Luther, Arnold Small and Richard Stallcup. The following curators generously provided committee members access to the collections in their care: Luis F. Baptista, California Academy of Sciences; Eugene A. Cardiff, San Bernardino County Museum; Stanley W. Harris, Humboldt State University; Ned K. Johnson, Museum of Vertebrate Zoology; Thomas R. Howell, University of California, Los Angeles; Dennis M. Power, Santa Barbara Museum of Natural History; Amadeo M. Rea, San Diego Natural History Museum; Ralph W. Schreiber, Los Angeles County Museum of Natural History. I wish to thank Lloyd Kiff for making available past records housed at the Western Foundation of Vertebrate Zoology, Albert Ghiorso for preparing internegatives from color slides, and Stephen F. Bailey and Luis F. Baptista for preparing the sonogram.

ACCEPTED RECORDS

YELLOW-BILLED LOON (*Gavia adamsii*). One adult in breeding plumage was seen flying north past Point Dume LA 20 Apr 1977 (KLG; 88-1980). An immature female was at Goleta SBA 23 Feb-12 Apr 1982 and was found dead on the last date (JLD; PL, GMcC, JO, REW; 48-1982; specimen 4543 Santa Barbara Museum of Natural History); photographs appeared in *AB* 36:330 and on the front page of the 28 Apr 1982 *Daily Nexus*, the campus newspaper for the University of California, Santa Barbara.

These are the first and second records for southern California. A previous report from Point Mugu VEN 5-9 May 1976 was rejected (Luther et al. 1983).

*LAYSAN ALBATROSS (*Diomedea immutabilis*). One was photographed 4½ miles off Point Pinos MNT 26 Jan 1980 (DR; 95-1982); photograph published by Roberson (1980). One was seen at the Cordell Banks MRN 23 Mar 1981 (BDP, JP; 16-1981).

This species is not always easy to distinguish from Black-browed Albatross (*Diomedea melanophris*), which regularly reaches the North Atlantic and which could reach the North Pacific. Subadult Black-browed Albatrosses have a dark bill tip, and an underwing and tail pattern very similar to that of Laysan. A useful distinction, not mentioned in current field guides, is the greater extent of dark mantle coloration onto the lower back of Laysan. This area is white on Black-browed.

MOTTLED PETREL (*Pterodroma inexpectata*). One was seen through a scope from shore at Point Mugu VEN 30 Dec 1981 (REW; 31-1982). For the first time in California this species was seen doing something besides dying.

STREAKED SHEARWATER (*Calonectris leucomelas*). One was photographed 2 km west of Moss Landing MNT 26 Sep 1982 (AB, BB, AC, JM, SWi; 97-1982); see Figure 1; this is the third accepted record for California and for North America. A previous report from Monterey Bay 14 Oct 1978 (*AB* 33:209, Roberson 1980, AOU 1983) has not yet been submitted.

WILSON'S STORM-PETREL (*Oceanites oceanicus*). Up to two were seen in Monterey Bay MNT 26 Aug-14 Nov 1982 (GMcC, REW; 116-1982). According to *AB* 37:219 up to three birds were present, but the Committee received details for only two.

BROWN BOOBY (*Sula leucogaster*). One immature was found dead at the south end of the Salton Sea IMP Oct 1967 (photograph of specimen by RAE; 36-1982); this record was not published in *AFN* or by McCaskie (1970) and its exact date is unknown. It was included in the summary by Garrett and Dunn (1981), and is number 1388 in the Humboldt State University collection.

OLIVACEOUS CORMORANT (*Phalacrocorax olivaceus*). One adult was photographed at the north end of the Salton Sea RIV 1 Aug-10 Sep 1982 (DSta; JLD,

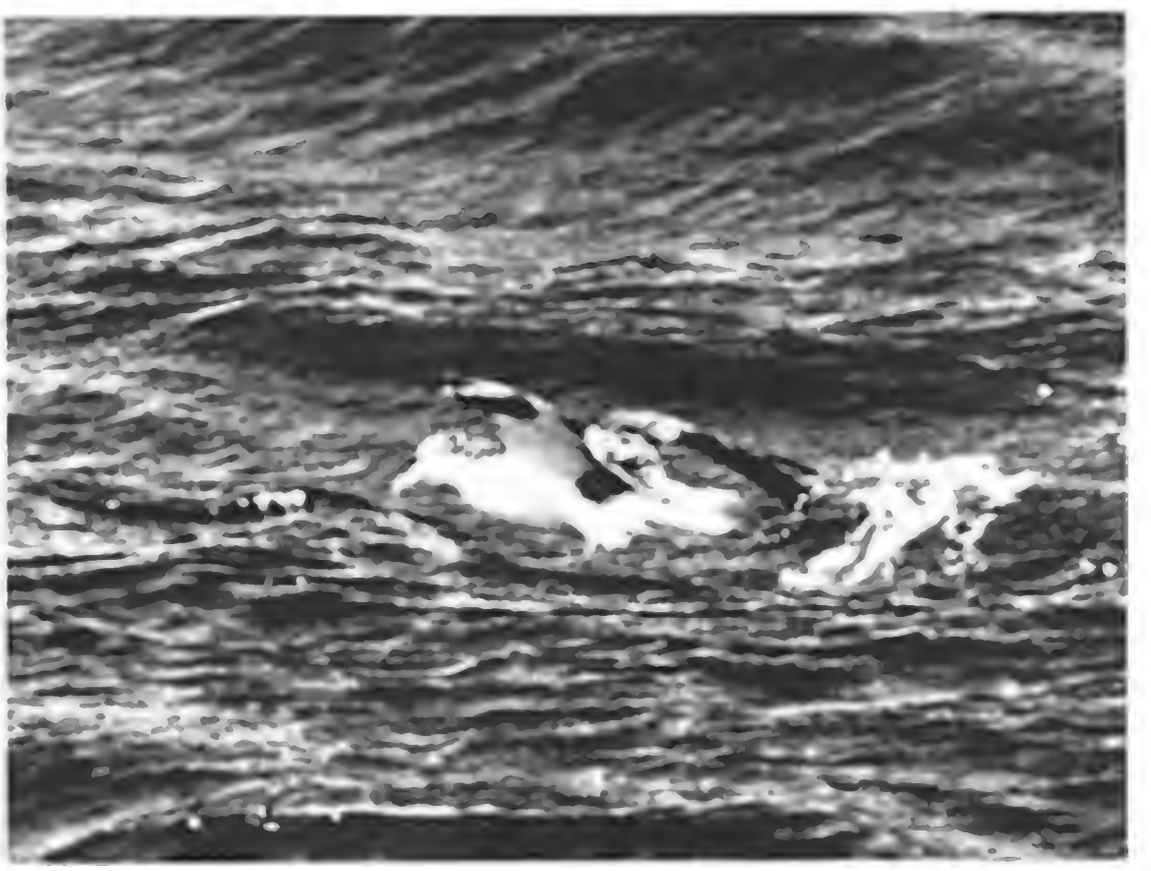

Figure 1. Streaked Shearwater, 26 Sep 1982, Monterey Bay, CA. See record 97-1982 under Accepted Records.

Photo by Steve Wilson

GRH, GMcC, REW; 76-1982). An adult was building a nest at the south end of the Salton Sea IMP 27 Feb-5 Mar 1983 (GMcC; 37-1983); the nesting was unsuccessful since there was only one bird involved and the nest site was taken over by a pair of Double-crested Cormorants (*Phalacrocorax auritus*).

YELLOW-CROWNED NIGHT-HERON (*Nycticorax violaceus*). Reports of an adult at San Elijo Lagoon SD 30 May-19 Jul 1982 (REW; 81-1982) and 20 Feb-29 Aug 1983 (GMcC; 36-1983) pertain to the same bird which has been at this locality on and off since 25 Oct 1981. Record 88-1981 (Binford 1985) is also probably of the same individual. One reported in nearby La Jolla SD 23 May-1 Jun 1983 (AB 37:912) was probably this same bird, although considered different by Unitt (1984).

BAIKAL TEAL (*Anas formosa*). A male collected at Niland IMP 29 Dec 1946 (photograph of specimen by SFB; 107-1983) is number 97120 at the Museum of Vertebrate Zoology; Laughlin (1947) and Garrett and Dunn (1981) incorrectly attribute this specimen to Calipatria, but the specimen label says "5 miles west of Niland." A male collected along the Santa Ana River near Riverside RIV 12 Jan 1974 (photograph of specimen by EAC; 108-1983) is number 2J75 at the San Bernardino County Museum. A male collected at Honey Lake LAS *27 Nov* 1974 (photograph of specimen by RAE; 109-1983) is number 3315 in the Humboldt State University collection; the correct date is *fide* Eugene Makishima; *AB* 29:736, McCaskie et al. (1979) and Roberson (1980) all give the incorrect date of 1 Dec. A male collected at Gray Lodge BUT 4 Jan 1975 (photograph of specimen by RAE; 110-1983) is number 3490 in the Humboldt State University collection.

Although the AOU (1983) considers records from southern California "may be based on escapes," the Committee has accepted these records because this species is a long distance migrant and there is enough of a pattern to indicate that this Asiatic species occasionally reaches California naturally. This species appears on the official state list (Jones et al. 1981) but the Committee has not previously validated any particular record. Don Roberson compiled details on five specimens, four of which were accepted on the first circulation. The fifth specimen record (Brentwood CC 13 Dec 1931) is pending final Committee action.

TUFTED DUCK (*Aythya fuligula*). One male at Cuddy Valley KRN 15 Jan 1980 (REW; 80-1982) may have been the same bird as record 49-1980 at nearby Quail Lake LA (Binford 1985). One male was at Point Mugu VEN 7-28 Feb 1981 (REW; 27-1982); Garrett and Dunn (1981) incorrectly state that this bird stayed through March. One male at Mill Valley MRN 7 *Feb*-8 Mar 1982 (RHo; 46-1982) was also present *12 Dec* 1980-*13 Feb* 1981 and is assumed to be the same individual as record 71-1980 (Binford 1985) returning to the same locality in subsequent winters; it is not the same bird attributed to "Tiburon ponds" in *AB* 35:332 but is one of two listed in *AB* 35:715 for the southern Marin Christmas Bird Count. The second bird has not yet been submitted to the Committee. A male was at Ferndale HMB 23-24 Feb 1982 (RAE; 25-1982). A female was at Foster City SM 20 Feb-*2 Apr* 1983 (JM; 33-1983). Two males were at Lake Perris RIV 22 Jan-21 Feb 1983 (GMcC, REW; 53-1983).

KING EIDER (*Somateria spectabilis*). An immature male collected at the mouth of the Eel River HMB 19 Nov 1975 (photograph of specimen by RAE; 25-1983) is number 3568 in the Humboldt State University collection. An adult male was photographed at Imperial Beach and Coronado SD *4 Dec* 1982-25 Jan 1983 (JLD, GMcC, REW; 109-1982); photograph published in *AB* 37:338; Unitt (1984) and *AB* 37:338 both give an incorrect discovery date of 3 Dec. A female was seen at Huntington Beach ORA 18 Dec 1982-31 Jan 1983 (JLD, GMcC, REW; 3-1983); photographs deposited in the San Diego Natural History Museum are not in Committee files. A

female was photographed at Emeryville ALA 19 Dec 1982-7 May 1983 (JAG; SFB, LCB, RL, JM; 7-1983). A female was photographed at Newport harbor ORA 26 Dec 1982-16 Jan 1983 (GMcC, REW; 52-1983). A female was photographed at Ventura marina VEN 23 Jul-18 Sep 1983 (JLD, PL, GMcC, REW, KZ; 56-1983); photograph published in *AB* 37:1027.

1982-83 was the best flight year for this species on record in California. The last significant flight was in 1973-74.

STELLER'S EIDER (*Polysticta stelleri*). An immature female was photographed at Crescent City harbor DN 16 Jan-30 May 1983 (JAR, RAE; LCB, HC, JLD, KH, GMcC, JM, BDP, DR, REW, AW; 9-1983); photograph published in *AB* 37:333.

This is the first North American record south of Vancouver Island.

MISSISSIPPI KITE (*Ictinia mississippiensis*). One photographed at Mono Lake MNO 31 May 1981 (MLM; 106-1982) was not the same individual as record 65-1981 (Binford 1985) seen 24-25 May 1981 at Furnace Creek Ranch INY, contrary to speculation in *AB* 35:858; the two birds were of different ages. One was seen at Olancha INY 30 May 1982 (JWil; 68-1982). One was seen at Imperial Beach SD 18 July 1982 (GMcC; 75-1982). One was photographed near Dulzura SD 12 Jun-30 Jul 1983 (GMcC, REW; 55-1983); the departure date of 28 Jul 1983 given by Unitt (1984) is incorrect.

All four of these records were subadults in their first spring or summer plumage.

ZONE-TAILED HAWK (*Buteo albonotatus*). An adult was seen at Corn Springs RIV 23 Apr 1982 (AS; 70-1982).

MONGOLIAN PLOVER (*Charadrius mongolus*). An adult was photographed at McGrath State Beach VEN 7-13 Aug 1982 (KLG, PL, GMcC, REW; 74-1982); photograph published in *AB* 37:224.

This is the second record for California.

SPOTTED REDSHANK (*Tringa erythropus*). One male in breeding plumage was photographed at the north end of the Salton Sea RIV 30 Apr-4 May 1983 (DDel, AS; JLD, GMcC, DR; 49-1983); see Figure 2.

This is the first record for California.

HUDSONIAN GODWIT (*Limosa haemastica*). A male in breeding plumage was photographed at Arcata HMB 17-20 May 1983 (RAE; 45-1983); two photographs published in *AB* 37:908 are not in Committee files.

RUFOUS-NECKED STINT (*Calidris ruficollis*). One in breeding plumage photographed at McGrath State Beach VEN 11-17 Jul 1982 (RHa, PL, GMcC, REW; 73-1982) is probably the same individual at this locality 12-17 July 1981 (record 42-1981, Binford 1985). Another in breeding plumage was photographed near Lancaster LA 23-29 Jul 1983 (JLD, PL, GMcC, LR, REW; 57-1983).

For information on the identification of this and other stints see Grant (1984) or Veit & Jonsson (1984).

BUFF-BREASTED SANDPIPER (*Tryngites subruficollis*). A juvenal was photographed near Petaluma SON 2-8 Sep 1982 (LCB; DKB, BDP; 77-1982). Another was seen at Point Mugu VEN 10-15 Sep 1982 (TEW; 100-1982).

LITTLE GULL (*Larus minutus*). One first winter bird photographed at Oceanside SD 27 Dec 1981 (REW; GMcC; 30-1982) was taken to Sea World in San Diego after it

became entangled in a fishing line and nearly drowned; it died in captivity 27 Mar 1982 and is now specimen 41883 at the San Diego Natural History Museum. An adult seen at Kelly Lake, Watsonville SCZ 1-2 Jan 1982 (JML, DR; 44-1982) was possibly the same bird as seen at the mouth of the Salinas River MNT *1 Jan*-20 Feb 1983 (JLD, DR; 35-1983). An immature was at Goleta SBA 10 May 1982 (PL; 49-1982). An immature was seen at Crescent City DN 19 May 1982 (RAE, GSL; 56-1982). One in first summer plumage photographed at the north end of the Salton Sea RIV 6 Jun 1982 (REW; GMcC, JO; 61-1982) was found dead 12 Jun 1982 and is now specimen 41796 at the San Diego Natural History Museum.

COMMON BLACK-HEADED GULL (*Larus ridibundus*). An adult seen at Huntington Beach ORA 13 Dec 1981 (GMcC; 94-1981) could have been the same bird as seen there the previous winter (records 219-1980 and 59-1981 in Binford 1985).

SANDWICH TERN (*Sterna sandvicensis*). One at San Diego Bay SD 15 May-13 Jun 1982 (FAH; DDei, GMcC, DR, REW; 58-1982) was probably the same individual seen there in May 1980 (record 80-1980 in Luther et al. 1983), which is the only other record for California.

SOOTY TERN (*Sterna fuscata*). An immature seen at the San Diego River mouth SD 27 Sep 1982 (REW; 19-1983) is the first for California.

Hurricane Olivia passed over several areas where this species breeds including a recently discovered colony at Alijos Rocks (Pitman 1983) about 500 miles south of

Figure 2. Spotted Redshank, 30 Apr 1983, Salton Sea, CA. See record 49-1983 under Accepted Records.

Photo by Arnold Small

San Diego, and probably displaced this bird northward. The statement in *AB* 37:224 that this species "does not normally occur within 1500-2000 miles of California" is incorrect. Although Unitt (1984) regarded this sight record as inadequate, it was accepted unanimously by the Committee.

BLACK-BILLED CUCKOO (*Coccyzus erythropthalmus*). One found dead at Humboldt Bay HMB 3 Oct 1979 (photograph of specimen by RAE; 37-1982) is specimen 4688 in the Humboldt State University collection; it was estimated to have been dead for 1 or 2 weeks when found.

BARRED OWL (*Strix varia*). One seen at Howland Hill east of Crescent City DN 5 Mar 1983 through at least 20 Apr 1983 (RAE; 28-1983) is the same individual present continuously since 12 Mar 1982 (record number 26-1982 in Binford 1985). Another heard at Salyer TRN, in the summer of 1981, was rediscovered there in Aug 1982 and was still present through at least 27 Jun 1983 (RAE; 47-1983); it was actually the first for California, but was not reported until after the Crescent City bird above. Another was heard at Willow Creek HMB 30 Apr-2 May (RAE; 48-1983).

These three birds are the result of this species' rapid range expansion in the Pacific Northwest over the last two decades. They appear to be permanent residents in the area.

WHITE-COLLARED SWIFT (*Streptoprocne zonaris*). One was studied at length through a scope at Point Saint George DN 21 May 1982 (RAE, GJS, GSL, RT, LB; 57-1982).

This is the first California record. Other United States records were discussed by Hardy and Clench (1982) and Lasley (1984). Although this species normally ranges north on the west coast only to Guerrero, Mexico (AOU 1983), there are at least four unpublished sight records from southern Sinaloa. A detailed analysis of the descriptions and sketches of this bird by J.V. Remsen Jr. at Louisiana State University indicates that this bird was probably an immature of the northern race *S. z. mexicana*. It had pale dusky feathers on the forehead, typical of this race, and a scaly or mottled breast band, characteristic of immatures.

BROAD-BILLED HUMMINGBIRD (*Cynanthus latirostris*). An immature male photographed at Fremont ALA early Jan-9 *Mar* 1982 (NM; 47-1982) was not the first northern California record as stated in *AB* 36:327 but the second, although the previous record (McCaskie et al. 1979) has not yet been reviewed. An adult male was seen in Short Canyon northwest of Inyokern KRN 18 Apr 1982 (RBH; 12-1983). A male was photographed in Santa Barbara SBA 13-17 Oct 1982 (PL; 101-1982). A male seen in Santa Barbara SBA 10 Jan-15 Feb 1983 (JLD, PL; 29-1983) was reportedly photographed, but the photographs were not submitted.

GREATER PEWEE (*Contopus pertinax*). One seen at Montana de Oro State Park SLO 26 Sep 1982 (GPS; CM; 26-1983) was exceptionally early; most previous records were of wintering birds.

EASTERN WOOD-PEWEE (*Contopus virens*). An adult male was photographed and song recorded near San Joaquin City SJ 18 Aug-*17* Sep 1983 (DY; LCB, JLD, AG, KH, JML, GMcC, JM, BDP, DR, REW; 60-1983); see Figure 3.

This is the second acceptable California record. A previously accepted record from Big Sycamore Canyon VEN (record 27-1975 in Luther et al. 1979) has been withdrawn by the observer based on new information on pewee calls and should be disregarded pending a final Committee decision. Another previous record from the Farallon Islands (record 88-1977 in Luther 1980) was discussed at the Committee

meeting of 18 Feb 1984 in view of recent published statements that the record was questionable (AOU 1983, Dunn and Garrett 1983b). The committee decided to take no action and this record stands as accepted.

*LEAST FLYCATCHER (*Empidonax minimus*). One seen on San Nicolas Island VEN 8-9 Jun 1974 (JLD, HLJ, GMcC; 133-1980) was not published in *American Birds* but was included in Garrett and Dunn (1981). One was seen at Point Reyes MRN 27 Sep 1979 (JM; 191-1980).

GREAT CRESTED FLYCATCHER (*Myiarchus crinitus*). One seen at Montana de Oro State Park SLO 30 Sep 1979 (PV; 81-1980) was not included in *American Birds* but was published by Garrett and Dunn (1981).

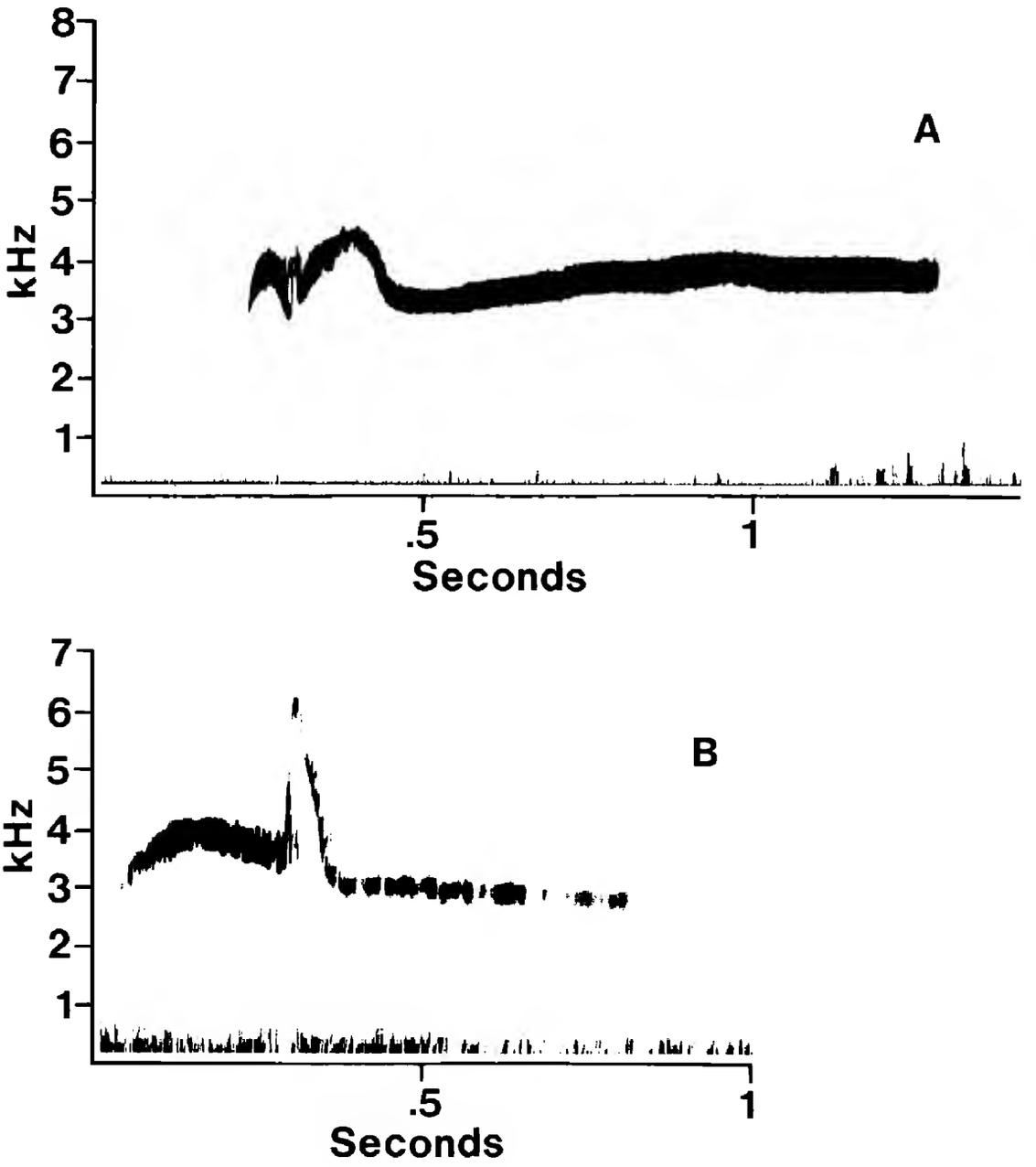

Figure 3. Eastern Wood-Pewee, 8 Sep 1983, San Joaquin City, CA. See record 60-1983 under Accepted Records.

Recorded by Jeri M. Langham

THICK-BILLED KINGBIRD (*Tyrannus crassirostris*). One was photographed in Peters Canyon in Lemon Heights near Tustin ORA *19* Dec 1982-9 Apr 1983 (JLD, GMcC, DR, REW; 110-1982); photograph was published in *AB* 37:339.

SCISSOR-TAILED FLYCATCHER (*Tyrannus forficatus*). An adult was seen near Gazos Creek mouth SM *13* Sep-5 Oct 1974 (LCB; 39-1982). One was seen at Hearst Castle, San Simeon SLO *10* May 1982 (GPS; 65-1982). Speculation in *AB* 36:894 that this might be the same bird as one at Point Piedras Blancas SLO 3-10 May 1982 seems unwarranted, as both were seen the same day. The Piedras Blancas bird has not yet been submitted.

VEERY (*Catharus fuscescens*). One was seen at Point Reyes lighthouse MRN 20 Jun 1982 (JML; JM; 87-1982). According to *AB* 36:1013, this bird was present through 24 Jun 1982, however the 21-24 Jun observations were at another locality at Point Reyes. The Committee considers the additional published dates as a separate record, possibly of a different individual, for which no documentation has been received. The Committee hopes to receive details from the many observers who saw it.

WOOD THRUSH (*Hylocichla mustelina*). One was photographed at Point Loma, San Diego SD 1-25 Nov 1982 (GMcC, REW; 114-1982).

GRAY CATBIRD (*Dumetella carolinensis*). One was seen at Guadalupe SBA 25 Apr 1982 (JD; 50-1982). One was seen at Point Reyes MRN 3 Jul 1982 (HAG; 90-1982).

These records are unseasonal for this species; most previous records are late fall or spring.

YELLOW WAGTAIL (*Motacilla flava*). One was seen and heard at Abbott's Lagoon, Point Reyes MRN 17 Sep 1978 (JPM, LPM; 114-1978). An adult was seen and heard flying over Bodega Bay harbor SON 16 Sep 1979 (BJM; 81-1979). An immature seen at Cayucos SLO 7 Sep 1981 (TE; JEM; 46-1981) is published here for the first time. One was seen and heard at Point Pinos MNT 19 Sep 1982 (JLD; RB, MM; 107-1982). An immature was photographed at Younger Lagoon and Wilder Creek mouth SCZ 4-6 Sep 1983 (DSin, CF, BL; LCB, JLD, AG, KH, GMcC, JM, JP, DR, DSie; 59-1983); see Figure 4.

These are the first five records for California. The call of the Yellow Wagtail is a distinctive slightly rising "tzzzeeet," quite high and penetrating. It has been likened to one of the calls of the Eastern Kingbird (*Tyrannus tyrannus*). The only wagtail with a similar call is the Citrine (*Motacilla citreola*) which is unrecorded in North America. An excellent account of the identification of immature wagtails has been published (Svensson 1977), but observers should be aware that immatures of the northeast Asian and Alaskan races are usually much duller than European forms. The exact subspecies of any of the California birds cannot be determined.

RED-THROATED PIPIT (*Anthus cervinus*). An adult was at Imperial Beach SD 8 Oct 1979 (GMcC; 162-1980). One was seen at Imperial Beach SD 11 Oct 1979 (GMcC; 163-1980). Another adult was at Imperial Beach SD 22 Oct 1979 (GMcC; 164-1980). These three individuals are the "two or three near Imperial Beach 8-22 Oct 1979" published in *AB* 34:202 and in Unitt (1984). Each bird was present only one day. One was photographed at Imperial Beach SD 10-11 Oct 1982 (REW; GMcC; 117-1982). Another was photographed at Imperial Beach SD 16-17 Oct 1982 (GRH; CM, GMcC, REW; 108-1982). Another was photographed at Imperial Beach SD 7 Nov 1982 (REW; GMcC; 112-1982).

WHITE-EYED VIREO (*Vireo griseus*). A singing male was photographed at Goleta SBA 18 May-14 Sep 1982 (PL; JLD, JMG, GMcC, BDP; 62-1982); a photograph was published in *AB* 36:895. One was at Point Loma SD 7 Jun 1982 (REW; GMcC; 60-1982). One was seen at Point Reyes MRN 19 May 1983 (DHE: 39-1983).

YELLOW-THROATED VIREO (*Vireo flavifrons*). A male was seen at Los Osos SLO 22-24 Apr 1982 (DSte; PL; 51-1982). One was photographed in Irvine ORA 19 May 1982 (DW; REW; 71-1982). One seen at Pico Creek near San Simeon SLO 3 Oct 1982 (JR; 22-1983) is previously unpublished.

PHILADELPHIA VIREO (*Vireo philadelphicus*). One seen at the Carmel River mouth MNT 12 Oct 1980 (DR; 225-1980) was not published as a separate record in *AB* 35:223 but was presumably included in the total of eight records summarized there. One seen at the Big Sur River mouth MNT 3 Oct 1981 (DR; 43-1982) is previously unpublished. One was seen at Arroyo Grande SLO 22 May 1982 (PS; 52-1982). One was at Point Loma SD 29-31 May 1982 (NBB; 69-1982). One was seen at Oasis MNO 29-30 May 1982 (GMcC, DR; 63-1982). One was at Point Loma SD 30 Sep 1982 (REW; 113-1982). One was at Harbor Lake, Harbor City LA 15-*18* Oct 1982 (BED; 20-1983). One seen at Huntington Beach ORA 26 Nov 1982-1 Jan 1983 (REW; SJR; 118-1982) was the second winter record for California.

For a useful discussion of the identification of this and other vireos see Terrill and Terrill (1981).

Figure 4. Yellow Wagtail, 6 Sep 1983, Santa Cruz, CA. See record 59-1983 under Accepted Records.

Photo by Dianne Sierra

GOLDEN-WINGED WARBLER (*Vermivora chrysoptera*). A male was seen at Agoura LA 2 Nov 1981 (SWo; NBB; 40-1982). A female was at Oasis MNO 23 May 1982 (GMcC, REW; 64-1982). A male was photographed at Santa Barbara SBA 22-23 Oct 1982 (JMG, PL, REW; 104-1982). A female was seen at Fullerton ORA 24 Oct 1982 (KT, JT; 18-1983).

YELLOW-THROATED WARBLER (*Dendroica dominica*). A singing male seen at Samoa HMB 24 May 1982 (RAE; 55-1982) was identified entirely by song and was not seen well enough to determine its subspecies group. However the statement in *AB* 36:891 that a yellow-lored form has occurred on the Farallon Islands in spring and fall is incorrect. All Farallon records were white-lored (DeSante and Ainley 1980). A singing male at Pacific Grove MNT 27 May 1983 (DR; 50-1983) was also white-lored.

CERULEAN WARBLER (*Dendroica cerulea*). One was seen at Mirror Lake, Yosemite Valley MRP 12 Oct 1981 (KLG; 22-1982).

PROTHONOTARY WARBLER (*Protonotaria citrea*). One was seen at Big Morongo Wildlife Preserve SBE 19 Sep 1981 (CM; 24-1983). One was at the University of California, Los Angeles campus, West Los Angeles LA 3-4 Oct 1981 (KLG; 21-1982). A male was seen at Santa Barbara Island SBA 24-25 May 1982 (CD; 67-1982). A singing male was photographed at Goleta SBA 2-3 Jun 1982 (JMG, PL; 53-1982). One was seen at San Diego SD 14 Sep 1982 (GMcC; 83-1982). A male photographed at Point Reyes MRN 30 Sep 1982 (RHi; 34-1983) is previously unpublished. One was seen at Baker SBE 3 Oct 1982 (EAC; 15-1983). One was at Point Loma SD 8 Oct 1982 (REW; 115-1982).

WORM-EATING WARBLER (*Helmitheros vermivorus*). One was photographed at Point Reyes MRN 28-29 Oct 1981 (BY, JE; 34-1982). One was seen at Goleta SBA 29 May 1982 (MDi; 54-1982). Another was at Goleta SBA 9-17 Sep 1982 (PL; 103-1982). One was seen at Sausalito MRN 9 Oct 1982 (MVMa, RLM; 88-1982). One was at Furnace Creek INY 30 May 1983 (LCB, GMcC, REW; 42-1983).

MOURNING WARBLER (*Oporornis philadelphia*). A female was seen at Point Reyes MRN 20-22 Jun 1982 (JM; 86-1982). One was seen at Carpinteria SBA 24 Sep-4 Oct 1982 (PL; 105-1982). A male seen at Tule Lake National Wildlife Refuge SIS 22 May 1983 (RLL; 43-1983) is previously unpublished. A singing male was photographed at Oasis MNO 28 May 1983 (LCB, JLD, EH, DK, GMcC, REW; 41-1983); see Figure 5.

A recent study indicates that there is more overlap between the measurements of this species and the MacGillivray's Warbler (*O. tolmiei*) than previously known (Kowalski 1983).

RED-FACED WARBLER (*Cardellina rubrifrons*). One was seen at Point Loma SD 11-12 Sep 1982 (LCB, GMcC, BDP; 79-1982); Unitt (1984) states that this bird was photographed, but photographs have not been submitted to the Committee.

*PAINTED REDSTART (*Myioborus pictus*). Up to two were seen at Big Bear Lake SBE 14 Jun-3 Jul 1982 (GMcC, BDP; 72-1982); *AB* 36:1017 states that three birds were in this area but we have documentation for only two. One was photographed at Oxnard VEN early Nov 1982-20 Feb 1983 (AN, MN; JLD, PL, REW; 30-1983). One was photographed in Santa Barbara SBA 11 Nov 1982-*12 Mar* 1983 (JMG, PL, GMcC; 31-1983).

SCARLET TANAGER (*Piranga olivacea*). One was seen at Point Fermin, San Pedro LA 8-11 Nov 1981 (BED; 10-1983). An immature male seen at Huntington Beach ORA 25 Nov 1982 (JLD, GMcC; 1-1983) was reportedly photographed, but the photographs are not in our files. A male was seen at Point Reyes MRN 20 Jun 1982 (JM; 85-1982). A female was at Point Loma SD 29 May-2 Jun 1983 (GMcC, REW; 54-1983). For information on identification, see Garrett and Dunn (1983).

NORTHERN CARDINAL (*Cardinalis cardinalis*). One was seen at Earp SBE 9 Dec 1981 (REW; 28-1982).

PAINTED BUNTING (*Passerina ciris*). One was photographed at Point Loma SD 10-15 Sep 1982 (LCB, GMcC, BDP, REW; 78-1982). Another was photographed at Point Loma SD 14-15 Sep 1982 (REW; GMcC; 84-1982). One seen at Goleta SBA 17-26 Aug 1983 (JLD, PL, GMcC, REW; 58-1983) was reportedly photographed, but the photographs are not in our files.

SHARP-TAILED SPARROW (*Ammodramus caudacutus*). One seen at Bolinas Lagoon MRN 4 Nov 1978-1 May 1979 (LCB; 38-1982) was one of up to four reported here in *AB* 33:804, but we have documentation for only one; it may have been the same bird returning for an additional winter as record 14-1977 (Luther 1980). Another at Bolinas Lagoon MRN *23 Oct* 1982-*26 Mar* 1983 (BDP, GMcC; 120-1982) was one of two reported here in *AB* 37:336, but we have documentation for only one which was probably one of three individuals (but not the banded bird)

Figure 5. Mourning Warbler, 28 May 1983, Oasis, CA. See record 41-1983 under Accepted Records.

Photo by Ed Harper

seen here the previous winter (record 222-1980 in Binford 1985). One seen at Dumbarton Point ALA 11 Dec 1981 (KFC; 35-1982) was not published as a separate record in *AB* 36:329 but was presumably included in the total of four birds summarized there. One seen at Palo Alto Baylands Refuge SCL *11 Oct* 1982-*1 Mar* 1983 and another there *29 Jan-1 Mar* 1983 (JM; 32-1983) were reportedly photographed, but the photographs are not in Committee files; they are probably different from records 79-1978 and 14-1979 (Luther et al. 1983) since none were seen here in 1979-80; but they could be the same as the maximum of three seen here *9 Jan-6 Feb* 1982, and two seen here 22 Nov 1980 (unpublished), but probably different from one seen at the Palo Alto Dump 22 Dec 1980 (unreviewed by the Committee).

UNACCEPTED RECORDS, identification questionable

YELLOW-BILLED LOON (*Gavia adamsii*). One photographed at Bodega Bay SON 29 Apr 1980 (15-1981); see Figure 6.

This record was based entirely on one slide and two color prints. The observers originally identified the bird as a Common Loon (*Gavia immer*) but concluded it was *adamsii* after noting that the slides showed an all pale culmen. This record was rejected by a vote of 3 in favor and 7 opposed on the third ballot. Those in favor pointed out that the pale culmen is the only completely reliable field character, and that the relatively small eye, distinct auricular patch, pale neck and distinctly curved lower outline to the lower mandible are all characteristic of *adamsii*. However the majority of the Committee were of the opinion that the apparent pale culmen could have been caused by photographic effect or aberration, that there should have been some dusky color at the base of the bill, and that the back color and pattern were wrong for an immature *adamsii*. The bird was an immature because of its curved culmen, relatively short bill and winter-like plumage in late April. The majority felt the plumage was entirely typical of Common Loon. For more information on identification of this species see Binford and Remsen (1974).

WHITE-TAILED HAWK (*Buteo albicaudatus*). An immature at Whittier Narrows Nature Center LA 22 Nov 1981 (75-1981).

This report would have constituted a first state record, but was defeated on the second ballot by a vote of 2-8. The pattern of the scapulars was not seen. On White-tailed they are dark with rufous edges; on Red-tailed Hawks (*Buteo jamaicensis*) they have prominent pale patches. Also the drawing which accompanied the description showed four emarginate outer primaries; there should have been only three. The flanks and undertail coverts should have been barred or mottled, not pure white as sketched; and the tail should have been shorter.

Despite these discrepancies, many committee members agreed that the bird looked more like a White-tailed Hawk than anything else. However, the west Mexican population is believed to be seriously declining, and the species is essentially resident. Thus it may not have much chance of reaching California as genuine vagrant. Many members admitted that, even if it was a White-tailed Hawk, they would probably reject it as an escape (origin questionable).

*SEMIPALMATED SANDPIPER (*Calidris pusilla*). One juvenal seen at Pescadero Marsh SM 17 Aug 1980 (189-1980).

This record was defeated on the fourth ballot by a vote of 7-3. The majority felt that the description was fine; the bill shape, size, call, foot webbing, and coloration were all perfect for this species. The minority was troubled by the dark brown back feathers

UNACCEPTED RECORDS, identification questionable

with "chestnut" fringes, arguing that a Semipalmated Sandpiper should not show this coloration. There appears to be confusion among Committee members and birders in general concerning color terminology. Observers are cautioned against using color terminology that may be misinterpreted; reference to a color chart (e.g. Smithe 1975) or to other bird species is advisable if not imperative.

ICELAND GULL (*Larus glaucoides*). One first-summer bird at Point Reyes MRN 18 Jul 1981 (81-1983).

This would have been a first state record if accepted. It was rejected by a vote of 0-10 on the first round. Members noted that it could not have been this species, because the bird was wearing a band and no Iceland or Thayer's gulls (*Larus thayeri*) were known to have been banded in the summer of 1980. Most members thought that it could have been a worn and/or bleached California (*L. californicus*), Glaucous-winged (*L. glaucescens*) or Western (*L. occidentalis*) Gull.

BROAD-BILLED HUMMINGBIRD (*Cynanthus latirostris*). An adult male at Joshua Tree National Monument (county not specified) 13 Apr 1974 (42-1982).

THREE-TOED WOODPECKER (*Picoides tridactylus*). One at Summit Camp west of Eagle Lake, Lassen National Forest LAS 16 Jun 1983 (46-1983).

Figure 6. Unknown species of loon. 29 Apr 1980. Bodega Bay, CA. See Yellow-billed Loon (record 15-1981) under Unaccepted Records, identification questionable.
Photo by Peter Kennedy

UNACCEPTED RECORDS, identification questionable

EASTERN WOOD-PEWEE (*Contopus virens*). One heard and photographed at Point Loma SD 18-26 May 1982 (94-1982).

This record was defeated 3-7 on the second round. Identification was based primarily on calls. This bird gave a variety of calls, some of which may be given by both species. Committee members disagreed as to which species gives which call and when. A majority felt that the calls attributed to this bird could have been given by Western Wood-Pewee (*C. sordidulus*), but a minority considered the described vocalizations diagnostic for *C. virens*. Clearly more research is needed. Any suspected *C. virens* seen in California should be voice-recorded to provide a permanent record that later may prove diagnostic. No specimen should be collected without prior voice recording. Phenotypically, most individuals of the two species are indistinguishable in the field and sometimes even in the hand. For further information on identification, see Dunn and Garrett (1983b) and Rising and Schueler (1980).

VEERY (*Catharus fuscescens*). One on Santa Barbara Island SBA 3 May 1982 (66-1982). One at Big Morongo Canyon SBE 17-18 May 1983 (40-1983).

See Dunn and Garrett (1983a) for notes on identification.

PINE WARBLER (*Dendroica pinus*). A male at Twin Oaks Valley north of San Marcos SD 28 Dec 1980 (8-1981). A male at Point Reyes MRN 14 Sep 1981 (32-1982).

The first was published in *AB* 35:720 and by Unitt (1984) but was defeated 6-4 on the fourth round. Most members felt the description was fine for an adult, but a minority were troubled by the incorrectly described wing coverts, dusky greenish-brown, instead of dark gray or blackish; the absence of a partial yellow collar setting off the darker face; and the average, instead of large, bill size.

The second was rejected 3-7 on the first circulation. Most members thought that it was a Blackpoll Warbler (*Dendroica striata*). The face, described as "unremarkably similar to Orange-crowned Warbler," would tend to eliminate Pine Warbler. There was no mention of the amount of exposed tail past the undertail coverts. It is much longer on Pine than on Blackpoll. For a recent discussion of this identification problem, see Whitney (1983).

WORM-EATING WARBLER (*Helmitheros vermivorus*). One at Pacific Grove MNT 12 Oct 1981 (93-1982).

This record was accepted in *AB* 36:215 but the observer credited with the observation did not see the bird. He only reported it on behalf of another.

*PAINTED REDSTART (*Myioborus pictus*). One near Duncans Mills SON 15-26 Feb 1982 (23-1982).

OLIVE WARBLER (*Peucedramus taeniatus*). A male in Placerita Canyon LA 23 Apr 1983 (38-1983).

UNACCEPTED RECORDS, origin questionable (identification accepted)

WHITE IBIS (*Eudocimus albus*). An adult photographed at Bolinas Lagoon MRN 14-19 May 1971 and at San Rafael MRN 27 June-15 Sep 1971 (14-1981).

This bird was rejected as an escaped captive by a vote of 6-4 on the fourth ballot (nine votes needed for acceptance). It was accepted as wild in *AFN* 25:794, in McCaskie et al. (1979) and by Roberson (1980). The AOU (1983) regarded it as an escape.

UNACCEPTED RECORDS, origin questionable (identification accepted)

Those in favor of wild origin for this bird pointed out that all the zoos in northern California were contacted and all known captive birds were present and accounted for. There is a weak pattern of spring and summer occurrences between the Mexican breeding grounds and the southwestern United States. The species has been shown to be capable of long-range vagrancy in North America, and this bird left in September—a pattern shown by other northward wandering individuals.

Those opposed to the wild status of this bird pointed out that all the recent coastal reports from southern California have been suspect since a number of White Ibis escaped from Busch Gardens in Los Angeles and elsewhere in the mid-1970s. Because all coastal records from southern California are questionable, they could not accept a coastal record from northern California.

BLACK-BELLIED WHISTLING-DUCK (*Dendrocygna autumnalis*). One at Thermolito Afterbay, Oroville BUT 27 Sep 1969 (24-1982).

This was accepted as the first regional record for northern California by *AFN* 24:90 but was regarded as an escape by McCaskie et al. (1979) and Roberson (1980). It was defeated on the first round by a vote of 3-7. Of the seven negative votes, five questioned its origin and two questioned its identification.

NORTHERN CARDINAL (*Cardinalis cardinalis*). A male visiting a feeder in Castro Valley ALA 29 Jun 1982 (89-1982).

UNACCEPTED RECORD, viable status of population questionable

GRAY PARTRIDGE (*Perdix perdix*). Multiple introductions over a 30+ year period; claimed road kills (three in four years) prior to 1976 near Cedarville MOD (140-1977).

Information provided by Bruce Elliott indicates that all these introductions failed and that no self-sustaining population ever existed. The claimed road kills were actually Chukars (*Alectoris chukar*). The record was rejected 0-10 and the species removed from the state list (see Jones et al. 1981).

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Accepted 2 July 1985

ROADSIDE RAPTOR CENSUS IN THE SAN JACINTO VALLEY OF SOUTHERN CALIFORNIA

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In recent years much emphasis has been placed on the conservation of raptors, which are generally low in numbers and tend to be highly sensitive to human activities such as shooting, pesticide use and habitat alteration (for a review see Newton 1979). Although the alteration and destruction of breeding habitat may currently be the greatest detriment to many bird species, the work of Fretwell (1977) on Dickcissels (*Spiza americana*) suggests that the loss of wintering habitat may, in some cases, be equally important. However, this aspect of raptor research has received comparatively little attention.

In 1981 we initiated a 2-year fall and winter study of raptors in the San Jacinto Valley to provide baseline data on populations in southern California and to quantify the importance of this valley as a wintering area for raptors.

STUDY AREA AND METHODS

The San Jacinto Valley of southern California is located in Riverside County approximately 25 km east of the City of Riverside. This rural valley consists predominantly of agricultural lands (alfalfa and grain crops) and dairy farms, with most urban development concentrated at the southeast end. Duck clubs, fallow fields and a small amount of riparian habitat make up most of the undeveloped land in the valley. The elevation of the valley floor averages approximately 425 m. During the winter months mean temperatures range from 1° - 21°C and mean levels of precipitation range from 2.6 - 6.4 cm per month.

Each census consisted of two observers driving a 43-km (38.8 km^2 as measured with a planimeter) route (Figure 1) recording all raptors seen with the unaided eye within 0.5 km of either side of the road. Species identification, age and sex (when possible), and perch site (description and height) were noted for most individuals. Habitat parameters were not considered as raptor distribution in the San Jacinto Valley appears to be heavily influenced by the occurrence of man-made perches. We maintained a vehicle speed of approximately 40 km/hr for most of the route, with occasional stops for positive identification when necessary. The open terrain and sparsity of trees along the route minimized duplicate sightings. During the 1981-82 study we drove the route approximately once every 5-10 days from 19 September 1981 through 8 March 1982 for a total of 20 censuses. In 1982-83 we drove the route approximately once per week from 5 September 1982 through 25 February 1983 for a total of 21 censuses. The duration of each census was approximately 2 hours (mean = 1.8 hr) ending at sunset.

RESULTS

Species composition and seasonal abundance were notably similar between the two years of study (Table 1). In 1981-82 we observed 1.5 rap-

tors/km (62.6 raptors/census or 1.61 raptors/km²) based on a cumulative total of 1252 raptor sightings in 860 km (776 km²). Similarly, in 1982-83 we observed 1.4 raptors/km (60.8 raptors/census or 1.57 raptors/km²) based on a cumulative total of 1276 raptor sightings in 903 km (814 km²).

Fourteen species used the valley during the two years of study. The only difference in species composition between years was the observation of a Merlin (*Falco columbarius*) in the second year. The two most abundant species during both years were the Red-tailed Hawk (*Buteo jamaicensis*) and American Kestrel (*Falco sparverius*). However, the abundance of Red-tailed Hawks was consistent between the two years (20.5/census ± 1.8 SE vs.

Table 1. Frequency of raptor sightings in the San Jacinto Valley, Riverside Co., California, fall-winter 1981-83.

Species	Number observed[a] 1981-82	1982-83
Osprey (*Pandion haliaetus*)	18(0.9)	5(0.2)
Black-shouldered Kite (*Elanus caeruleus*)	84(4.2)	72(3.4)
Bald Eagle (*Haliaeetus leucocephalus*)	1(0.1)	1(0.1)
Northern Harrier (*Circus cyaneus*)	38(1.9)	107(5.1)
Cooper's Hawk (*Accipiter cooperii*)	2(0.1)	5(0.2)
Red-shouldered Hawk (*Buteo lineatus*)	18(0.9)	20(1.0)
Red-tailed Hawk (*Buteo jamaicensis*)	409(20.5)	425(20.5)
Ferruginous Hawk (*Buteo regalis*)	20(1.0)	73(3.5)
Rough-legged Hawk (*Buteo lagopus*)	3(0.2)	6(0.3)
Golden Eagle (*Aquila chrysaetos*)	8(0.4)	16(0.8)
American Kestrel (*Falco sparverius*)	637(31.9)	513(24.4)
Merlin (*Falco columbarius*)	------	2(0.1)
Prairie Falcon (*Falco mexicanus*)	12(0.6)	10(0.5)
Burrowing Owl (*Athene cunicularia*)	2(0.1)	2(0.1)
Total	1252(62.8)	1276(60.8)

[a]Cumulative total of all censuses, with mean per census in parentheses.

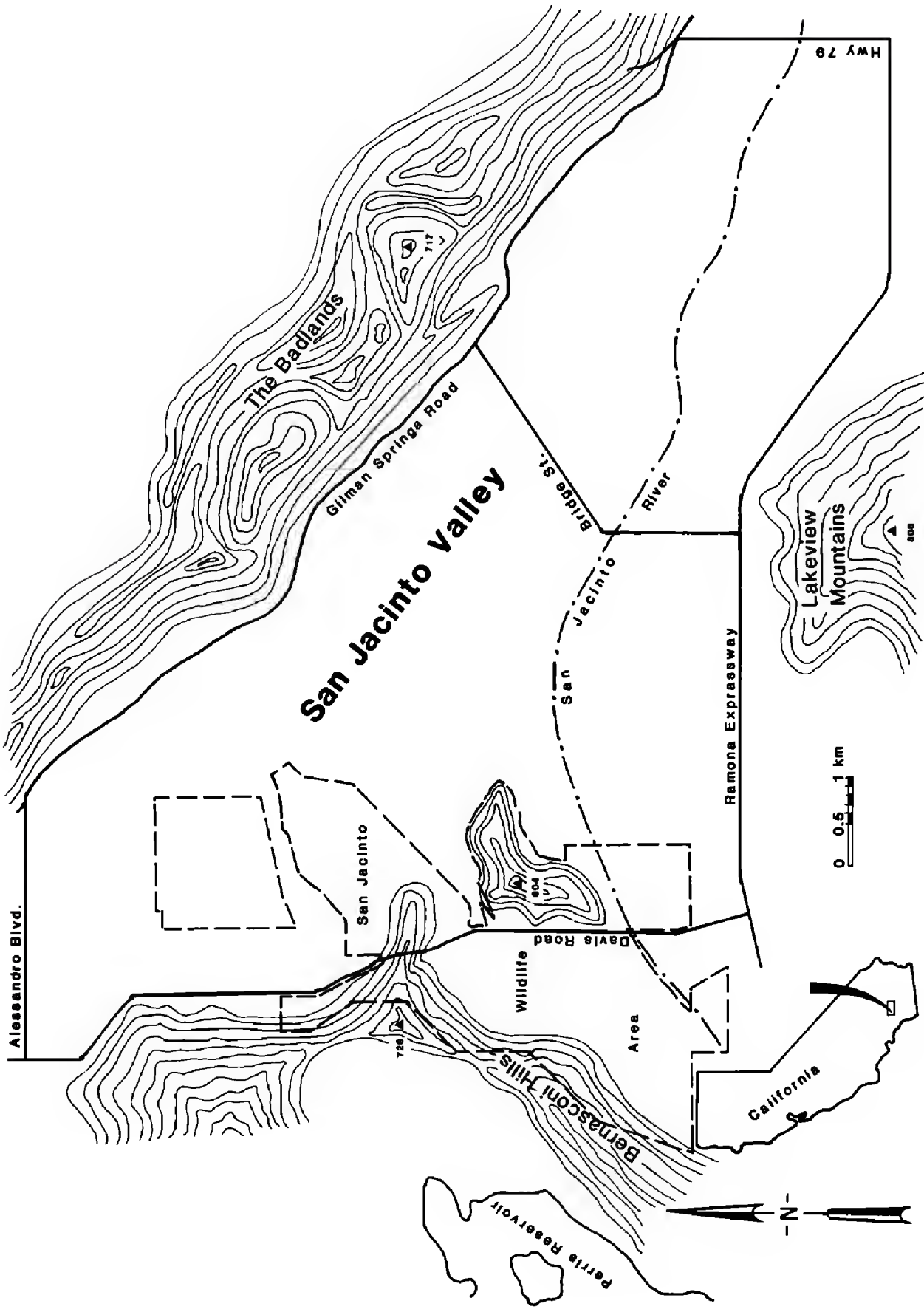

Figure 1. San Jacinto Valley raptor census route.

20.2/census ± 1.9 SE), whereas that of the American Kestrel was significantly lower (Student's t-test, $p < 0.01$) during the second year (31.9/census ± 2.1 SE vs. 24.4/census ± 1.6 SE). Of the other species recorded along the census route, Black-shouldered Kite (*Elanus caeruleus*), Red-shouldered Hawk (*Buteo lineatus*) and Prairie Falcon (*Falco mexicanus*) also occurred in similar numbers both years. Northern Harrier (*Circus cyaneus*) and Ferruginous Hawk (*Buteo regalis*) were the only two species to have notably increased in the second year (Table 1).

A substantial number of raptors were already present within the valley on the first census in both September 1981 and 1982, indicating that many raptors, but predominantly American Kestrels, had already migrated into the area from their breeding grounds (Figure 2). In general, American Kestrels occurred in relatively high numbers from September through January, decreasing to a much lower breeding population in February and March (Figure 2). Heavy rains causing major flooding and road washouts in the valley during late winter prevented further censusing after February 1983. Casual observations in March 1983, however, indicated that the abundance of raptors had markedly declined as had occurred in 1982. The high number of Red-tailed Hawks which were observed in February 1983 may have been a result of the unusually harsh winter in northern California that year.

A relatively early record for the most northerly breeding migrant, the Rough-legged Hawk (*Buteo lagopus*), occurred in 1981, when an individual was observed along the census route on 3 October. In contrast, during 1982 this species was not recorded until 2 December.

In addition to the raptors recorded during roadside counts, we observed several other species at other times of day or just off the census route. These species were Turkey Vulture (*Cathartes aura*), Swainson's Hawk (*Buteo swainsoni*), Sharp-shinned Hawk, (*Accipiter striatus*), Common Barn-Owl (*Tyto alba*), Great Horned Owl (*Bubo virginianus*) and Short-eared Owl (*Asio flammeus*). Additionally, in January 1983 McKernan saw an immature Peregrine Falcon (*Falco peregrinus*) during casual observations along the census route.

Although only one Bald Eagle (*Haliaeetus leucocephalus*) was observed during each year of censusing, several other individuals also wintered in the valley. During the winter of 1981-82 we recorded at least four individuals just off the census route, and four Bald Eagles were also recorded on 27 December 1982 (McKernan 1983).

Of the 866 Red-tailed Hawks recorded during the two years, 63.4% were adults, 27% were immatures and 9.6% were unclassified. Immature plumaged birds made up a significantly greater (chi-square test, $p < 0.01$) proportion of the population in 1982-83 when 33.2% were immatures as compared to 20.2% in 1981-82. In both years the proportion of immatures in the population was much lower than in the Sacramento Valley where 46% of those wintering Red-tailed Hawks for which age was determined were immatures (Wilkinson and Debban 1980).

Of the 1161 American Kestrels recorded during the two years, 26.9% were males, 64.2% were females, and 9% were unclassified. This greater abundance of females is similar to that found in other studies of wintering American Kestrels (Koplin 1973; Mills 1975, 1976; Wilkinson and Debban

1980) and may reflect the selection of open habitats, such as the San Jacinto Valley, by females (Koplin 1973, Mills 1976).

Perch site selection by raptors in this study was heavily influenced by the scarcity of trees in the San Jacinto Valley. Of the 2157 raptors for which flight behavior and perch type were recorded, 23.2% were flying, 11.1% were on natural structures (tree, rock, ground, etc.), and 65.7% were on man-made structures. Although controversial (see Olendorff et al. 1981), the view that utility poles and lines are beneficial to at least some raptors appears to be supported by the results of this study in which 76.8% of all perched raptors were on utility poles or wires.

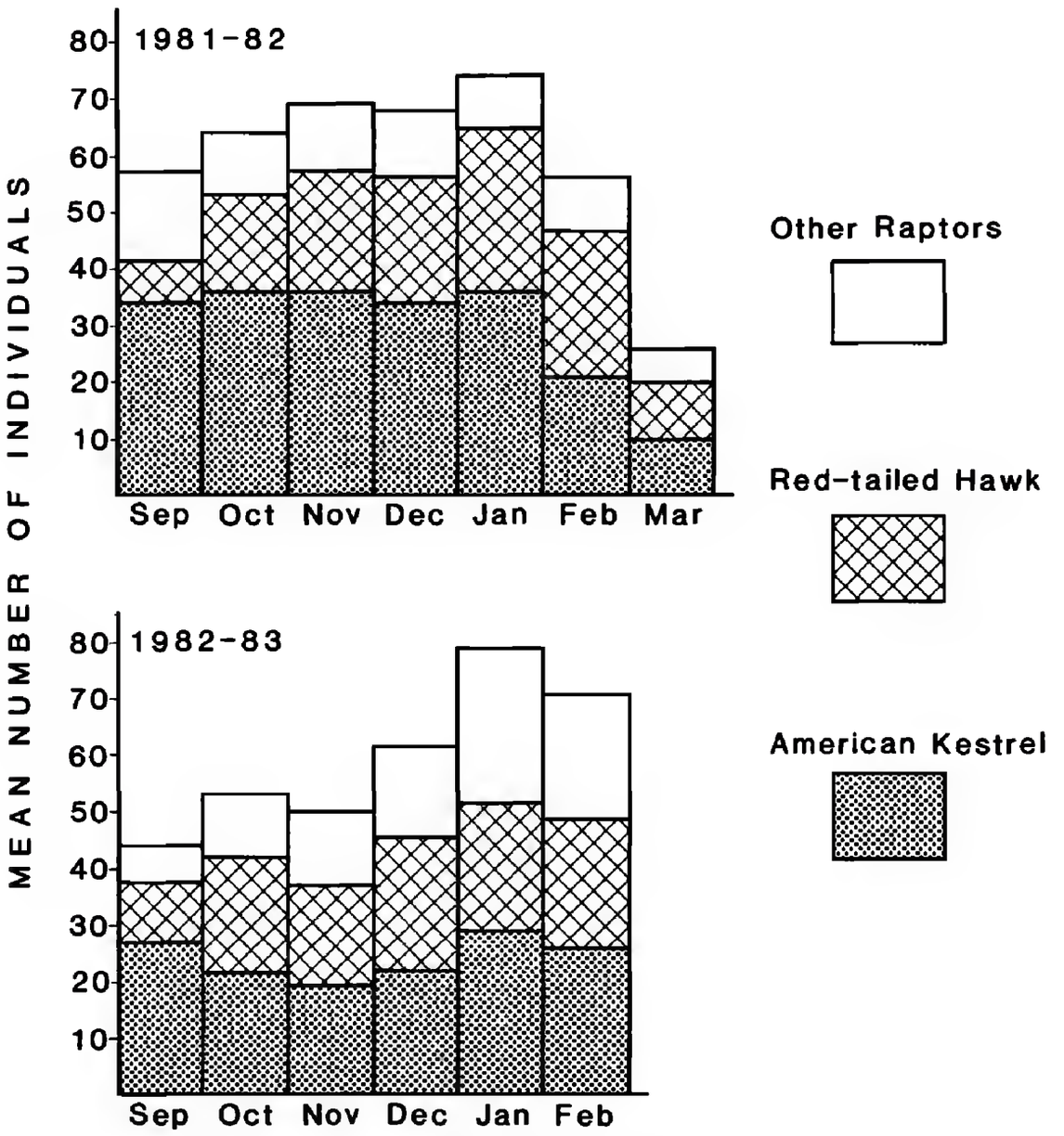

Figure 2. Mean monthly population of raptors in the San Jacinto Valley, Riverside Co., California.

DISCUSSION

Although comparative data for other areas in southern California are lacking, the mean numbers of raptors observed during two years of study, 1.5/km and 1.4/km, indicate that the San Jacinto Valley and similar surrounding areas are of major importance to wintering birds of prey.

Most areas outside southern California studied in a similar fashion (Table 2) are characterized by much lower raptor densities. This indication is especially true for Red-tailed Hawks and American Kestrels. Our study indicates that raptor densities in the San Jacinto Valley are from 5 to 17 times higher than those reported for other areas. However, the areas listed in Table 2 differ in species composition, with Rough-legged Hawks, Golden Eagles (*Aquila chrysaetos*) and Prairie Falcons being among the most common species. In northern California, density estimates for Red-tailed Hawks and American Kestrels (Wilkinson and Debban 1980) were similar to those in this study indicating that these two areas are probably similar in overall raptor densities.

The future existence of areas important to wintering raptors in Riverside County is dubious. Since 1950, the human population of the county has more than quadrupled, and almost all development has occurred in the rich agricultural lowlands west of San Jacinto Valley. Currently, development is expanding into the physiognomically similar Moreno Valley to the north of San Jacinto Valley and into Perris Valley to the southwest. Although it is difficult to assess the impact of the eventual loss of habitat in these interior

Table 2. Partial results of seven wintering raptor census studies.

	Individuals/km driven				
Study area	Rough-legged Hawk	Red-tailed Hawk	American Kestrel	All species	Number of species
California (San Jacinto)	0.01	0.5	0.7	1.5	14
California[a] (Sacramento V.)	0.061	0.54	0.54	---	13
Colorado[b] (El Paso Co.)	0.022	0.011	0.018	0.11	8
Utah[c] (Cache Valley)	0.055	0.053	0.068	0.3	14
Utah[d] (Provo)	0.014	0.002	0.003	0.1	12
Idaho[e]	0.048	---	0.019	0.085	---
Michigan[f]	0.059	0.085	0.026	0.32	6

[a]Wilkinson and Debban 1980
[b]Bauer 1982
[c]Gessaman 1982
[d]Woffinden and Murphy 1977
[e]Craig 1978
[f]Craighead and Craighead 1956

valleys upon wintering raptors, it seems likely that their utilization of other probably suboptimal areas will reduce survivorship. We encourage the initiation of similar raptor studies in other portions of California which may identify important wintering areas and point out population trends.

ACKNOWLEDGMENTS

We thank Bruce A. Henderson and John R. Storrer for their assistance in the field and Terry C. Sciarrotta of the Southern California Edison Company, Division of Research and Development, for his valuable support and assistance throughout the study. Cameron W. Barrows, Peter H. Bloom, Charles T. Collins and Tim Manolis reviewed earlier drafts of this report. This research was financially supported by the Southern California Edison Company, Division of Research and Development through purchase order C1801901.

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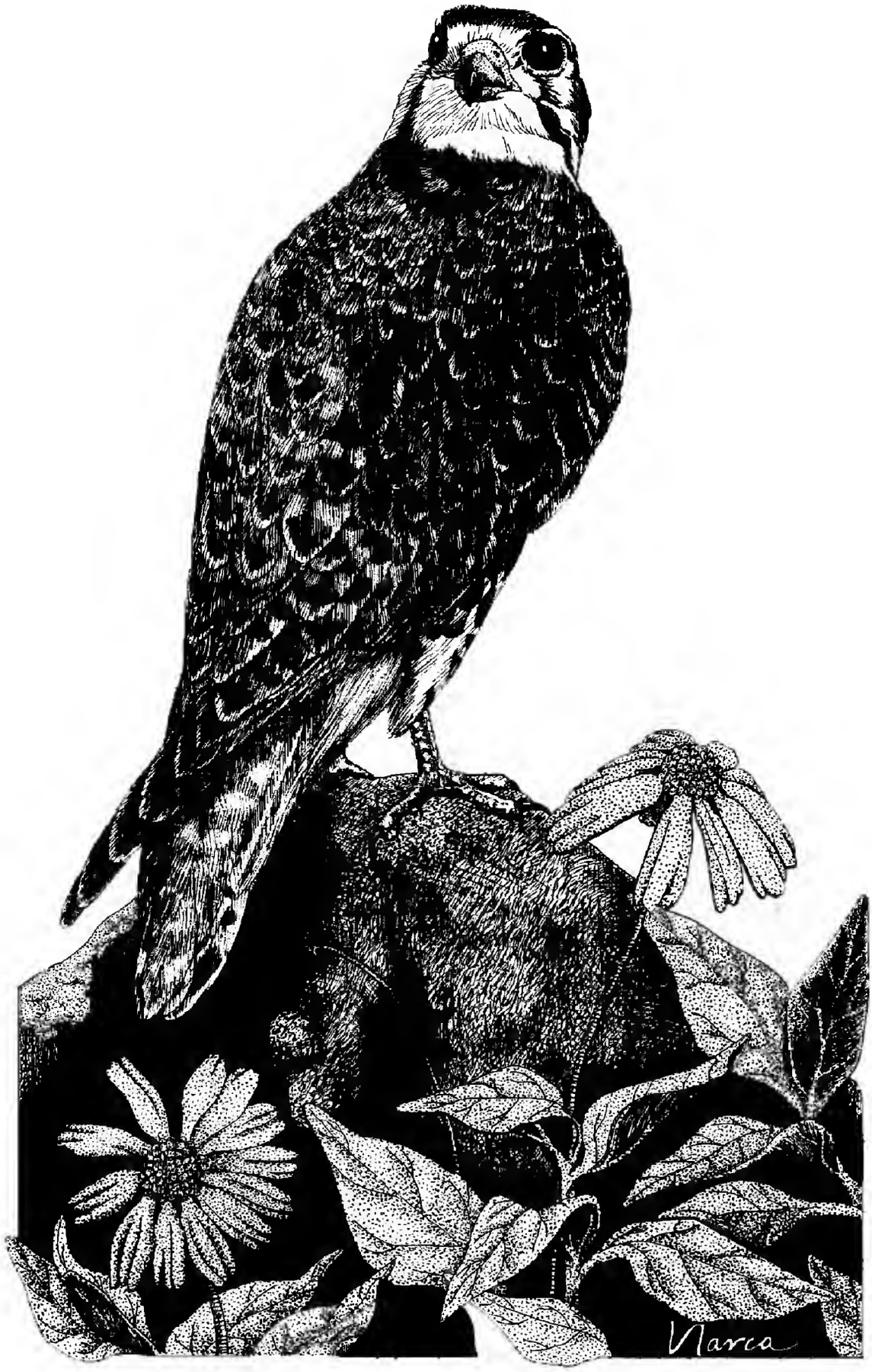

Prairie Falcon and Brittlebush *Sketch by Narca Moore-Craig*

WHITE TERNS ON OAHU PRODUCE SIBLINGS FIVE MONTHS APART

DOROTHY H. MILES, 2957 Kalakaua Avenue, Apt. 116, Honolulu, Oahu, Hawaii 96815

White Terns (*Gygis alba*) commonly breed on remote atolls and islands in tropical and subtropical regions, including the Northwestern Hawaiian Islands (NWHI). In 1961 a pair of these seabirds was reported to be breeding at Koko Head on Oahu (Ord 1961), the only main Hawaiian Island where they have been found. Since then the terns have expanded their nesting area some 16 km to the civic center of Honolulu. Harrison et al. (1984) estimated 50-100 pairs in the main Hawaiian Islands.

Dorward (1963) found that the White Tern was one of the few species on Ascension Island to have a distinct annual breeding season, laying about January. Individual pairs laid on the same ledge in successive seasons with an interval of close to a year. On Christmas Island in the Central Pacific Ocean Ashmole (1968) found that incubation and chick-rearing took about 5 months and molt about 5.5 to 7 months. Howell (1978) found the incubation period to be 35 days. Pettit et al. (1981) found the White Tern to be one of only two terns with prolonged incubation and to have the longest incubation in relation to its egg mass of any tern. A single egg is laid but no nest is built.

Here I present the results of my study of White Tern breeding biology on Oahu. I describe differences occurring in individual breeding pairs; these previously undescribed differences concern the lengths of intervals between breeding which, in turn, affect the number of offspring produced in one year.

STUDY AREA AND METHODS

The breeding area of the first pair of White Terns to exhibit an unusual breeding pattern (Pair 1 in 1979) became the focal point of a 6-year study. This small nesting area was located in Kapiolani Park on the south shore of the Island of Oahu between Diamond Head crater and the Pacific Ocean. The 45 m x 90 m area contained 13 ironwood (*Casuarina equisetifolia*) trees spaced 3.6 m to 5.4 m apart and surrounding a central open space. In 1982 this nesting area was extended to include a nearby Kiawe (*Prosopis pallida*) tree. A row of high-rise oceanfront condominiums served as a protective barrier. This urban park environment had traffic on three sides and other human activity in the area. Several species of introduced land birds and escaped cage birds competed for nesting trees but no other White Terns bred there.

The focal area was one of 16 White Tern breeding areas which I monitored in Kapiolani Park (1975-1984). Breeding here was discovered in October 1970 (Berger 1981). The 68 ha park extends about 1 km from Diamond Head to Waikiki parallel to the shoreline. The park has a central athletic field and numerous picnic areas which receive much human use. In addition to the ironwood from Australia, many large, old trees introduced from Asia and Africa offer the White Terns ample choices of nest sites. I recorded 56 nest sites in 14 species of trees. Breeding pairs sought isolation; distances between

nests were always greater than 10 m. I generally made daily observations for periods ranging from a few minutes' check to more than 8 hours. Night observations of sleeping perches in the focal area were made to help determine the identity of individuals remaining in the area. Some terns arrived on their perches after dark and left before dawn; therefore, periodic night checks also assured more accurate data on population size.

Beginning in May 1981 chicks were banded at about 5 weeks of age with both a numbered anodized aluminum band and a color-coded plastic band. Moynihan (1962), while studying White Terns on Moto Nui Islet off Easter Island, noted that each bird selected a station on which it perched most of the time. Consistent use of one perch by an unbanded bird during a breeding season and in subsequent seasons provided strong evidence of its identity. The terns' attachment to a particular perch and to their chosen nest sites, along with slight variations in physical appearance as well as differences in behavior and vocalizations, made individual identification possible. The sex of breeding partners was determined during observations of courting and copulation. Howell (1978) noted that in birds marked before the egg-laying stage he could usually tell by subsequent behavior which was male and which female.

Chicks that hatched before 1981, including the first four offspring of Pair 1, were not banded. Nevertheless after 6 years of daily observations of this isolated pair and their extended family, I am convinced that I was observing the same individuals.

RESULTS

Most pairs of White Terns initiated nesting activity in January or February, reared a single chick and were gone by November. However, some pairs (hereafter called short-cycle breeders) laid again after rearing a chick and hatched second or third chicks. These pairs did not leave the area when annual breeders left if they were courting again, incubating an egg or rearing a chick. The percentage of short-cycle breeders increased from 20% in 1979 (1 of 5 pairs) to 37% in 1984 (11 of 28 pairs monitored that year). In 1980 the nest limb of a pair of short-cycle breeders was cut off by tree-trimmers and, therefore, lost to my study. By August 1984 12 pairs had produced offspring on a short breeding cycle in Kapiolani Park. A pair nesting on private property at Diamond Head reared one chick in 1983 and was discovered to be a short-cycle breeder in 1984, bringing the total known on Oahu to 13 pairs.

Relationship Between Three Pairs

In 1978 Pair 1 established a new breeding area. An infertile egg was laid on 8 June, incubated for 126 days and abandoned on 12 October when the pair left the area. In January 1979 Pair 1 returned to the same nest and reared two chicks 5 months apart. These two 1979 siblings (hereafter called Pair 2) mated and began breeding in February 1981 at ages 18 and 23 months. In 1980 Pair 1 reared two more siblings 5 months apart. The two 1980 siblings (hereafter called Pair 3) began breeding in December 1981 at ages 16 and 21 months. Pair 2 and Pair 3 remained in their natal area and

also bred at short intervals; they produced nine third-generation chicks during the same period (1981-1984) that their parents (Pair 1) reared seven additional offspring.

Intervals Between Egg-Laying for Three Related Pairs

Between June 1978 and December 1984 pairs 1, 2 and 3 laid 24 eggs and produced 20 offspring in the focal area. Intervals between egg-laying are shown in Table 1.

I found five other short-cycle breeding pairs in five different areas, one in 1980 and four in 1983. Two of these pairs had been recorded as annual breeders because they had reared a single chick during the previous year. In 1984 I discovered that four more pairs of annual breeders had laid at short intervals and produced chicks. Therefore, a total of six pairs changed their

Table 1. Dates of egg laying, approximate intervals between eggs laid, and number of eggs laid and chicks fledged for three related White Tern pairs in Kapiolani Park, Oahu, Hawaii, from June 1978 to December 1984.

Year	Date Egg	Interval (months)	Date Egg	Interval (months)	Date Egg	Interval (months)	TOTAL Eggs	TOTAL Chicks
PAIR 1								
1978	8 Jun	8					1	0
1979	16 Feb	5	11 Jul	7			2	2
1980	24 Feb	4	3 Jul	4			2	2
1981	16 Jan	5	2 Jun	5	28 Oct	5	3	3
1982	27 Mar	10					1	0
1983	11 Jan	5	29 May	7	23 Dec	5	3	3
1984	16 May	7	22 Dec				2	1
						Total	14	11
PAIR 2								
1981	26 Feb	5	21 Jul	7			2	2
1982	2 Mar	12					1	1
1983	14 Mar	16					1	0
1984	23 Jul						1	1
						Total	5	4
PAIR 3								
1981	13 Dec	15					1	
1982								1
1983	13 Mar	8	8 Nov	5			2	2
1984	31 Mar	5	15 Sep				2	2
						Total	5	5
						Grand Total	24	20

breeding pattern from an annual cycle to a short cycle between 1982 and 1984. Two of these pairs hatched second eggs in December 1983 after rearing chicks and reared three offspring each in 1984, and one of these pairs laid again on 24 December 1984. Of these 12 pairs, 6 bred on a short cycle from their first year of breeding (1979-1984).

Dorward (1963) recorded the intervals between egg-laying for 59 pairs of White Terns. Most (35 pairs) laid at intervals of 11 or 12 months. Of 15 birds banded in the first season, all but 3 returned with the same partner and laid on the same spot in the second season. I recorded intervals of 11 to 15 months between egg-laying for 10 pairs that laid on the same nest site for 2 to 5 years and reared a single chick during each year. This finding is similar to that of Ashmole (1968) and Dorward (1963).

Breeding Success

I compared the breeding success during 5-year periods of two pairs that bred annually (Pair A and Pair B) with that of a pair that bred on a short cycle (Pair 1). These three pairs had been monitored regularly between 1978 and 1984 and supplied the most reliable data over the longest period. Pair 1 reared more than twice the number of offspring as Pair A or Pair B (Table 2).

Intersibling Behavior

Howell (1978) noted that young White Tern chicks were tolerant of any adult bird that came to the nest site; such visitors frequently approached, preened and brooded a small chick. If a parent returned while the visitor was present, it quickly attacked and chased away the intruder.

I observed similar behavior and also feeding of chicks by visiting adults. In August 1979 a 5-day-old chick was visited by its older sibling, a 5-month-old fledgling identified by black underwing coverts. A parent sitting nearby after brooding the chick did not chase off the older sibling during this first visit, but subsequent visits were not tolerated by either parent. In 1980 this same bird, then a juvenile and still showing black underwing coverts, was often observed guarding, occasionally feeding or awkwardly attempting to brood the new chick (its youngest sibling) when the parents were away, but was always chased off when a parent returned.

Howell (1978) found older chicks to be very aggressive toward non-parent adults or juveniles that approached. I found that older chicks—from about 21 days of age to first flight at about 45 days of age—assumed an aggressive posture when a non-parent adult sat near them or attempted to brood them, but not all succeeded in routing the visitor. I also observed an attack on a 46-day-old chick by an adult visitor that was breeding in an adjacent tree. The adult bird grasped the bill of the chick in its bill and twisted it back and forth until the chick fell, resulting in its first flight. I also observed the contrary behavior when a 10-week-old fledgling grasped the bill of an adult visitor that had just fed it a fish and forced the struggling adult off the nest limb.

I have found no data in the literature on the White Tern that describes the ages and behavior of offspring at critical stages of development, nor precise figures on the length of time that parents continue to feed them after they fledge. From 1978 to 1984 I monitored the rearing of 95 chicks of 45 pairs

and found the following in most parents and offspring: both parents fed the offspring on the nest site for the first 45 days, until the chick was 6.5 weeks old and made its first trial flight off the nest limb. The fledgling then picked a perch of its own above the nest if possible. It used its voice for the first time, if needed, to attract a parent with fish to its new location.

After 3 weeks of practice flight in the breeding area, the 10-week-old fledgling flew to sea where it practiced fishing for 3 weeks while the parents

Table 2. A comparison of the breeding success during 5-year periods of two pairs of White Terns that bred annually (Pairs A and B) and one pair that bred at intervals of 5-7 months (Pair 1) in Kapiolani Park, Oahu, Hawaii.

Year	Egg laid	Egg lost*	Chick hatched	Chick lost**	Eggs laid	Chicks fledged	Offspring reared
PAIR A							
1978	May		Jun		1	1	1
1979	Apr		May		1	1	1
1980	Jan		Feb		1	1	1
	Dec				1	0	
1981		Jan			0	0	0
1982	Apr		May	Jun	1	1	0
				Totals	5	4	3
PAIR B							
1979	Aug		Sep		1	1	1
1980	Apr		May		1	1	1
1981	Mar		Apr		1	1	1
1982	Apr		May	Jun	1	0	0
1983	Mar	Apr			1		
	May		Jun		1	1	1
				Totals	6	4	4
PAIR 1							
1979	Feb		Mar				
	Jul		Aug		2	2	2
1980	Feb		Mar				
	Jul		Aug		2	2	2
1981	Jan		Feb				
	Jun		Jul		3	3	3
	Oct		Nov				
1982	Mar	Oct			1	0	0
1983	Jan		Feb				
	May		Jun		3	3	3
	Dec		Jan '84				
				Totals	11	10	10

* Two eggs abandoned due to storm and pigeons; one to egg infertility.

** Fledgling injured in flight; four-week chick vanished; (causes unknown).

continued to feed it. At 13 weeks of age it could feed itself but parents continued to hold fish for it, sometimes for many hours. The independent offspring then picked a new perch or left the area. Offspring were fed for 91 days. Total parental care including incubation required 126 days minimum.

DISCUSSION

White Terns breeding on a "short cycle" produced twice the number of offspring each year as annual breeders. As the population in my study area grew the number of pairs that bred at short intervals increased. When some of the annual breeders changed their breeding pattern to short-cycle breeding, they produced twice the number of offspring they had been producing during their first year or two of breeding.

This unexpected finding suggests that a change may be taking place in the breeding biology of the Oahu White Terns that may not be taking place in the White Terns in other areas. At French Frigate Shoals, for example, environmental changes brought about by human occupation have caused a White Tern population to become established where none existed before 1965 (Rauzon & Kenyon 1984). Also, according to Harrison et al. (1984) the White Tern population on Midway Atoll has greatly increased in the past 50 years due to the introduction of the ironwood (*Casuarina litorea*). This tree provided additional habitat which is relatively unaffected by Black Rats (*Rattus rattus*) introduced in 1943. These environmental changes increased the number of White Terns in these two areas but no change in their annual breeding pattern was noted.

The short intervals between breeding found in the Oahu White Terns appears to be unique to Oahu. Other White Tern populations have not been found to exhibit short-cycle breeding; long-term monitoring is needed to confirm these differences in their breeding biologies.

Oahu may have survival advantages not found in other areas: mild climate, unlimited choice of arboreal nest sites, habitats that allow low-density breeding and the privacy White Terns seem to prefer. Nearby fishing grounds provide a variety and year-round availability of food (Harrison et al. 1983). The occasional feeding of chicks by older siblings may minimize the difficulty of rearing two or three offspring during a year.

Lack (1968) said, "adaptations of birds to the external environment which affect the number of young raised . . . are closely interrelated and have evolved through natural selection in the natural habitat of the species. Hence findings in habitats much modified by man may be misleading."

A comment by Darwin (1859) regarding inhabitants of oceanic islands may also be food for thought: "Species occasionally arriving after long intervals of time in the new and isolated district, and having to compete with new associates, would be eminently liable to modification, and would often produce groups of modified descendents."

The similarity in the breeding patterns of Pair 1 and four of their offspring strongly suggests a genetic basis for short-cycle breeding in White Terns. However, the apparent behavioral plasticity of some pairs switching from annual to short-cycle breeding leaves this question open for further research.

Figure 1. Two-week-old first chick of Pair 1, 3 April 1979, on nest site in *Casuarina* tree where previous egg was laid in June 1978.

Figure 2. Seventh chick of Pair 1—a day-old ball of fluff—in the small fork of the *Casuarina* tree where eight eggs were laid previously. The bird on the right is side-stepping away to let her mate take his turn brooding the chick. Photo taken 3 December 1981.

Figures 3 and 4. Typical postures of a White Tern visitor before it attempts to brood a young chick. This chick is 1 week old. An older chick would display a defensive posture—leaning forward with bill open—and resist the approach of any visitor except its parents. Photos taken 9 December 1981.

Figure 5. This rare photo of Pair 1 parent and two 1979 siblings shows the 5-month-old sibling—identified by black underwing coverts—visiting the new chick on 20 August 1979. It was not chased off as it was in subsequent visits.

Photos by Dorothy H. Miles

ACKNOWLEDGMENTS

Barbara Macaulay showed me a young White Tern in a Kiawe tree in July 1975. The parents returned to the same nest site in 1976 and became the first breeding pair in my study. Her report of this pair was published in the Hawaii Audubon Journal (Macaulay 1976). Kim and Teruo Sasaki, Kay Ahearn, Pat Purcell, Venona Honchell and many others to whom I owe my gratitude have reported valuable information to me over the years. I am especially grateful to Barbara B. DeWolfe who first made me aware of the value of my work and urged me to band the birds and publish my findings. Banding, care and replacement of fallen chicks, medical treatment and autopsies were made possible through the cooperative efforts of the Hawaii Division of Forestry and Wildlife, the Honolulu Zoo, the Honolulu Fire Department Unit 7, and the Department of Parks and Recreation, with special thanks to Ron Walker, Tim Burr, Tim Sutterfield, Marie Morin, Peter Luscomb, Margo Lengen, Keo Tenjoma, Bob Miyashita and Steve Salis; and to Drs. Eric Ako and R.W. Steckelberg for veterinary services. I also thank the U.S. Fish and Wildlife Service, the Zoology and Science departments of the University of Hawaii and all who generously supplied information and references including G.C. Whittow, C.J. Ralph, Maura Naughton and Carl Fieber. For their help and advice on the first drafts of this paper I am indebted to Andrew J. Berger, Ronald Walker, Marie Morin and Marion Steinhauser, and for later drafts, Sheila Conant, Craig Harrison and Leonard Freed.

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Accepted 17 January 1985

ADDENDUM

This report updates my continuing study to July 1985 and presents new evidence that attacks on chicks by adult or juvenile visitors appear to be pre-copulatory behavior and can limit the number of offspring reared (e.g., Pair 2, Table 1).

Twenty-four pairs were monitored. Five new pairs reared three chicks. Nine returned annual breeders reared six chicks, lost one, and were incubating one. A pair that lost their chick last year (the attackers of chicks of Pair 1 and Pair 2 since 1982) had not yet laid. Ten pairs of short-cycle breeders had produced 13 chicks by mid-July, including 3 sets of siblings. (Of 12 pairs, 2 had lost their nest limb due to tree-trimming in 1981 and 1984.) The three focal pairs (Table 1) increased their total production from 20 to 24 offspring. The failure of Pair 2 to produce a sibling in 1982 and the loss of their first egg in 1983 and first chick in 1984 can be attributed to hostile attacks by a pair that had usurped their night perch. One of this pair seemed determined to throw their chick off the nest and take over the nest site. I had seen this behavior in unmated juvenile siblings since 1980, but never the take-over of a perch by an intruder. I had observed attacks by this pair in 1983 and 1984. From 4 May to 20 May 1985, I watched them daily attacking the 3-week old chick of Pair 2. It was finally wrestled to the ground, but rescued. Both parents aggressively chased them, but attacks continued until courting and copulation began, after which a benign visit was made to the chick and they left the area, apparently to find a new nest site.

TREASURER'S REPORT

WESTERN FIELD ORNITHOLOGISTS, INC.

Cash Flow Statement for 1 January 1984 to 31 December 1984

Cash on hand, 1 January 1984		$ 3,499.46
RECEIPTS		
Membership	$13,731.45	
Boat Trips	4,403.00	
Annual Meeting	1,896.00	
Back Issues	512.00	
Reprints	1,209.28	
Interest	42.08	
Miscellaneous	35.00	21,828.81
DISBURSEMENTS		
Western Birds	$10,826.66	
Boat Trips	3,950.00	
Annual Meeting	989.87	
Membership/Business Services	1,449.53	
Postage	1,487.92	
Miscellaneous	176.70	18,880.68
Cash on hand, 31 December 1984		$ 6,447.59

J. Garth Alton, *Treasurer*

NOTES

VOCALIZATIONS OF THE BLACK-HEADED GROSBEAK

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Although the breeding biology and singing behavior of the Black-headed Grosbeak (*Pheucticus melanocephalus*) have been examined (Weston 1947; Ritchison 1983a, b; 1985), little information is available concerning grosbeak vocalizations. The purpose of this note is to describe the vocalizations of the Black-headed Grosbeak and briefly indicate the context(s) in which the vocalizations were uttered.

Observations and recordings were made almost daily from 1 April through 31 August in 1977 and 1978 at the Malibu-Guinavah Forest Camp, 10 km east of Logan, Cache County, Utah (see Ritchison 1983a for description of this area). Grosbeak vocalizations were recorded at 9.5 cm/sec with a Nagra IIIB tape recorder equipped with an Altec 633A microphone and a 62-cm parabolic reflector. Vocalizations were analyzed with a Kay Elemetrics Sona-Graph (Model 6061B) using the wide-band filter. Sound parameters were obtained by converting linear measurements on the sonagrams into time (horizonal axis) or frequency (vertical axis) measurements.

The *chip* call (Figure 1A) consisted of a single note averaging 0.04 ± 0.01 sec (N = 22) in duration. This call began at a frequency of 3.10 ± 0.04 kHz and rose sharply to a frequency of 6.00 ± 0.15 kHz. This call was uttered by both male and female grosbeaks in a variety of situations, i.e., as paired birds moved through their territories prior to nesting or when an adult approached the nest to assume incubating or brooding duties or to bring food to the young (Ritchison 1983a).

The *wheet* call (Figure 1B) averaged 0.10 ± 0.02 sec (N = 35) in duration. This call exhibited an up-slur, beginning at an average low frequency of 2.20 ± 0.18 kHz and rising to an average high frequency of 2.90 ± 0.13 kHz. This call was given by both males and females and was only uttered when a bird took flight.

The *squeal* call (Figure 1C) consisted of a single note repeated in a series. Individual notes averaged 0.08 ± 0.01 sec (N = 54) in duration and were uttered at a frequency of 3.5 to 4.0 kHz. This call was given by both males and females when being handled or when a nest containing eggs or young was approached by a human or other potential predator. For example, this call was uttered by a female when a Sharp-shinned Hawk (*Accipiter striatus*) flew to a nest and removed two nestlings. Similar calls have been reported in a number of species (Norris and Stamm 1965, Stefanski and Falls 1972, Rohwer et al. 1976). Such calls could startle a predator and allow a captured individual to escape or could elicit harassment or distraction behavior that may divert the attention of a predator from a nest or young.

The *che-le-up* call (Figure 1D) was given at a frequency of 2.0 - 3.0 kHz and averaged 0.28 ± 0.02 sec (N = 18) in duration. This call was given by young grosbeaks from the time they were a day or two old until just after fledging. While giving this call, a young grosbeak would stretch its head and neck upward, flap its wings, and open its mouth. Such behavior elicited feeding from the adults.

The *phee-oo* call (Figure 1E) averaged 0.44 ± 0.04 sec (N = 20) in duration and was uttered at a frequency of 2.0 - 3.5 kHz. This call was first given by young

grosbeaks a few days prior to fledging and was uttered by the young for several weeks after fledging. This call was given when a young grosbeak sighted a parent with food or heard a parent calling or singing (Ritchison 1983a,b).

The juvenal *squeal* call (Figure 1F) consisted of a single note repeated rapidly in a series. The individual notes averaged 0.15 ± 0.01 sec (N = 44) in duration with an average frequency of 3.0 - 4.0 kHz. This call was uttered in conjunction with *phee-oo* calls (Ritchison 1983a,b).

I wish to thank Keith L. Dixon for his guidance throughout this study. I also thank Cameron Barrows and an anonymous reviewer for helpful comments on the manuscript. This investigation was supported by grants from the Frank M. Chapman Memorial Fund of the American Museum of Natural History and from Sigma Xi.

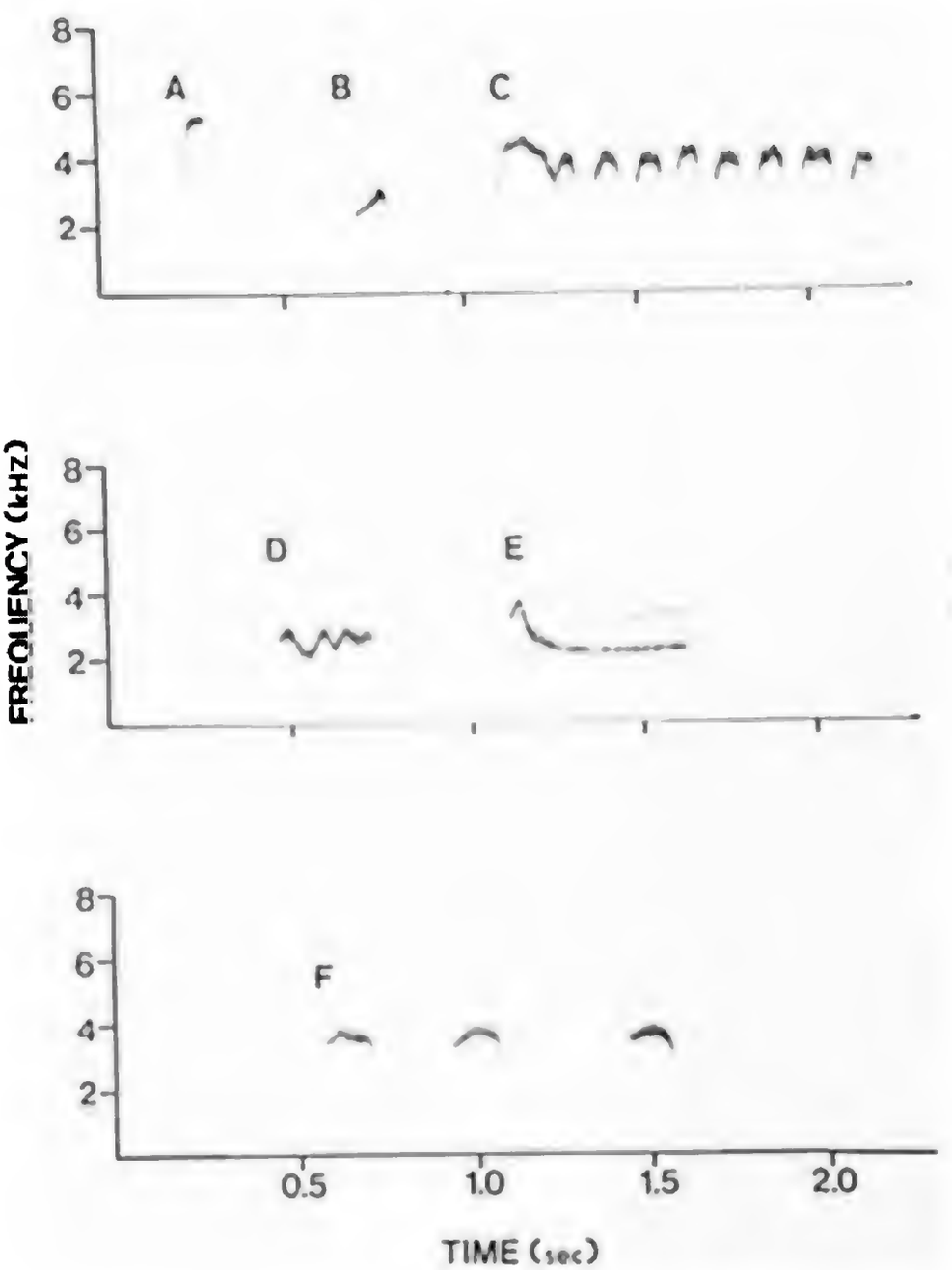

Figure 1. Sonagrams of Black-headed Grosbeak vocalizations: (A) *chip;* (B) *wheet;* (C) adult *squeal;* (D) *che-le-up;* (E) *phee-oo;* (F) juvenal *squeal.*

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Accepted 11 February 1985

UNUSUAL WESTERN BLUEBIRD EGGS

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Usually bluebirds (*Sialia* spp.) lay unmarked light blue eggs (Bent 1949). Albinistic eggs have been reported for all three North American species (Musselman 1935, Laskey 1939, Power 1966, Eltzroth 1983), but are considered unusual. The fertility of albinistic eggs has been confirmed for the Eastern Bluebird (*S. sialis;* Musselman 1935, Laskey 1939) and the Mountain Bluebird (*S. currucoides;* Power 1966, Munro et al. 1981) but not the Western Bluebird (*S. mexicana*).

During the 1984 nesting season, a Western Bluebird laid 16 white eggs in three separate clutches (6, 5 and 5 eggs) in the same nest box near Golden, Jefferson Co., Colorado. All 16 eggs were fertile and of normal weight (pers. obs.). Their average dimensions were 20.1 x 15.6 mm, which according to Bent (1949) is typical for the Colorado race *bairdi*. This high fertility rate is similar to that for albinistic eggs of the Mountain Bluebird (96.1%; Munro et al. 1981) and in the Eastern Bluebird (96.1%; Laskey 1939). The second clutch of 5 eggs was destroyed by a House Wren (*Troglodytes aedon*), which I determined using criteria described by Pinkowski (1975). Fertility was determined by finding the 5 partially developed eggs shortly after they were destroyed. Those clutches that hatched did so within the usual 2-week incubation period (Eltzroth 1983). The nestlings appeared to be typical and grew in a characteristic manner (McCluskey et al. 1977), were banded at about 10 days of age and fledged 19 to 21 days after hatching.

The female did not manifest any abnormal coloration. She was captured and banded during the fifth day of incubation of the first clutch and weighed a normal 31.0 g. Both adults cared for the nestlings.

I thank Ed and Cindy Betts for allowing access to their property where the birds nested, Robert R. Cohen for assisting in collecting the data and commenting on this manuscript, and Don Elias and Laurence C. Binford for helpful suggestions on the manuscript.

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Accepted 6 May 1985

FIRST UTAH RECORDS OF THAYER'S AND MEW GULLS, WITH COMMENTS ON THEIR REGIONAL DISTRIBUTION AND STATUS

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Over the last few decades, there has been a generally widespread increase in North American gull populations (e.g., see Conover et al. 1979, *Am. Birds* regional reports). Although this trend principally involves the commoner species, a number of extralimital species (i.e., "rarities") also have been documented. However, the apparent increase in reported rarities exceeds that of the commoner species. This apparent increase is at least partly due to an increase in the number and expertise of field observers (see Fussell et al. 1982). A significant proportion (majority?) of these "rarities" are immature birds, notable in being difficult to identify (Fussell et al. 1982, Grant 1982, Farrand 1983). Recent identification articles (e.g. Gosselin and David 1975, Lehman 1980, Lauro and Spencer 1980) as well as the newer "sophisticated" field guides (e.g. Farrand 1983, Scott 1983) have greatly contributed to heightened observer awareness, resulting in increased discoveries of "rarities." Thus, it should not be surprising to find that previously unrecorded species "suddenly" occur with regularity in small numbers. However, apparently sudden changes in status and distribution of a given species should be viewed with caution and, for each case, evidence supporting a particular explanation should be provided.

On 13 November 1982 I observed two first winter Thayer's Gulls (*Larus thayeri*) flying across an impoundment at Farmington Bay, north of Salt Lake City, Utah. Both individuals were paler and more uniformly tan-colored overall than nearby immature Herring (*L. argentatus*) or California (*L. californicus*) gulls. In flight, the back and upper wings were notably lacking in contrast except for the three outermost primaries and the tips of the next four to six primaries, which were somewhat darker brown. From below, the primaries and secondaries were white. The upper tail surfaces were brown and slightly darker than the outermost primaries. The bills of both birds were entirely black. Both had darker feathers around the eyes, resulting in a "punched-in-the-eye" appearance. All of these characters are consistent with descriptions of typical first winter Thayer's Gulls (Gosselin and David 1975, Lehman 1980) and collectively satisfy the requirements to "build a case for identification" (see Gosselin and David 1975, Fussell et al. 1982).

On 9 February 1984 I located a first winter Mew Gull (*L. canus brachyrynchus*) at the Salt Lake City sanitary landfill (Figure 1). The bird was in the company of some 4000 gulls, of which roughly two-thirds were Ring-billed (*L. delawarensis*). Relative to the Ring-billed Gulls, the Mew Gull was easily 10% smaller and appeared shorter-legged. Its bill was a little shorter and about half the thickness of that of a Ring-billed. The small bill, in conjunction with a rounded crown resulted in a "dove-like" appearance. The body plumage was uniformly grayish-brown except for a slight profusion of slate-gray feathers on the upper back, and whitish mottling in the belly. The tail was grayish brown and blended into heavily barred upper tail coverts. The under tail coverts were mottled brown on white, and generally darker than the lower belly. In flight, the upper wing coverts were darker brown and primaries lighter colored than those of immature Ring-billed Gulls. A careful study of the middle secondary coverts and tertials revealed distinctly rounded and evenly colored "centers" filling all of the feather but the outermost edge, which was tan-white. In contrast, the dark centers of these feathers in immature Ring-billed Gulls were concave-edged with pointed tips and largely restricted to the distal third of the feathers; thus, each feather was predominately white. These characters separate immature Mew from Ring-billed gulls

and eliminate the possibility of "Common Gull" (*L.c. canus* or *L.c. kamchatkanensis*), as discussed by Lauro and Spencer (1980) and Grant (1982).

Although both these records constitute first documented sightings for Utah (accepted by the Utah Field Ornithologists Records Committee), the occurrence of these gull species in Utah should come as no surprise. Both species winter commonly along the west coast, arriving there by lengthy migrations from their breeding grounds in arctic Canada and Alaska (AOU 1983). In addition, both species occur regularly in Nevada and Colorado (Kingery 1979). Since the 13 November sighting, Thayer's Gulls have been seen with increasing regularity in northern Utah. One was present near Logan, Cache Co., 10 to 12 December 1983. Another was at the Salt Lake City landfill 17 December 1983 (Figure 2) with up to four there from 19 February 1984 through at least the first week of March when the gulls began to disperse. Three more were located about 8 miles NW of Logan on 17 March 1984, with at least one remaining through 19 March. All were first year birds. In addition, this species was seen regularly during the fall of 1983 at American Falls Reservoir, Idaho, about 90 km north of the Utah border. The initial sighting was of three individuals on 6 November with four or five individuals present through at least 26 November (M.H. Tove and C.H. Trost). With the possible exception of one bird, all of these gulls were in first winter plumage. However, the only previous records from Idaho are of adults from Coeur d'Alene in the northernmost part of the state (Rogers 1977, 1978, 1981). This point is significant because it suggests that Thayer's Gulls (especially immatures) occur regularly and have been overlooked. This supposition is further supported by a general reluctance of many local observers to address the problems of immature gull identification, particularly when a species that is difficult to identify is involved.

Likewise, a similar scenario applies to the Mew Gull. Although immatures are fairly distinct, given a knowledge of the correct field marks, the "traditional" field guides

Figure 1. First winter Mew Gull at the Salt Lake City sanitary landfill, 9 February 1984. Note the very small bill, uniformly brown plumage and shape of the "centers" of the secondary coverts (see text).

Photo by Michael H. Tove

have been very misleading or even incorrect in their treatments. Thus, like Thayer's Gull, Mew Gulls are probably more common than current records indicate. In summary, it is suggested that increased observation of gull concentrations in the northern Great Basin region will reveal that Thayer's Gulls are uncommon to rare and Mew Gulls are rare to occasional winter visitors. Mew Gulls were noted in exceptionally large numbers in the interior portions of Oregon (Mattocks 1984) and northern California (LeValley and Rosenberg 1984) during the winter of 1983-1984. The effects of this incursion were noted as far east as coastal North Carolina where a first winter bird (*L.c. brachyrynchus*) was observed (LeGrand 1984). It is likely that these occurrences relate to the severe weather patterns of fall 1983 (see Lehman 1984), and the appearance of Utah's first Mew Gull was perhaps related to this incursion.

The following individuals were corroborating observers and provided data pertaining to the duration of stay of the birds: Keith Archibald, John and Terry Barnes, Mark Bromley, Don Hadley, Steve Hedges, Sue Hinde, Bill Hunter, Mark Leppert, Ella Sorensen, Merrill Webb. Thanks are extended to Keith L. Dixon who reviewed the manuscript and made several helpful suggestions.

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Figure 2. First winter Thayer's Gull at the Salt Lake City sanitary landfill, 17 December 1983. This individual was darker than average but still paler in flight than an immature Herring Gull. Note the whitish remiges from beneath and the lack of contrasting dark primaries on the upper wing.

Photo by Michael H. Tove

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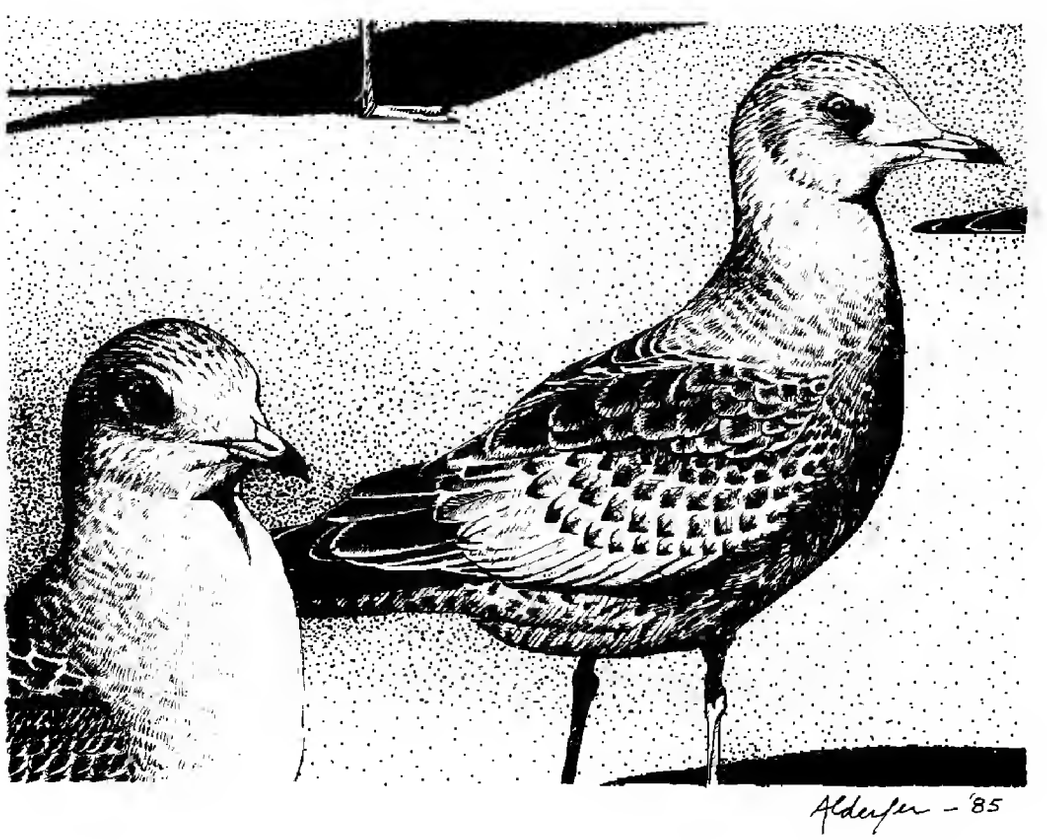

Mew Gulls, first winter *Sketch by Jonathan Alderfer*

A RECORD OF PRETERRITORIAL COPULATION BY SANDHILL CRANES

CARROLL D. LITTLEFIELD, Malheur Field Station, Box 260-E, Princeton, Oregon 97721

The Malheur-Harney Lakes Basin, Harney Co., Oregon, is an important traditional spring stopover area for the Pacific Flyway Population of Lesser Sandhill Cranes (*Grus canadensis canadensis*). Located in southeast Oregon, mowed and flooded meadows south and east of Burns provide excellent feeding, loafing, and roosting habitat for a majority of the 20,000 to 23,000 cranes in the population (Littlefield and Thompson, Proc. Crane Workshop 3:288-294, 1981). Individual birds remain in the basin from several days to a few weeks before continuing north to nesting regions in southwest Alaska.

Migrants begin arriving in southeast Oregon in late February, peak in early April, and most have departed by early May. Herter (M.S. thesis, Univ. Alaska, College, Alaska, 1982) reported that members of the population arrived in southeast Alaska on 22 April 1979 and 19 April 1980; peak numbers occurred during the last week in April, with most flocks gone by mid-May. Cranes arrive in western Alaska in early May and nest initiation has been observed in mid-May (Boise, M.S. thesis, Univ. Alaska, College, Alaska, 1977). Considering Lesser Sandhill Cranes begin nesting about 2 weeks after arriving on their territories, copulation may regularly occur during migration. Here I report on copulation by a pair of Lesser Sandhill Cranes at least 3500 km from the nearest known nesting area.

While examining cranes for neck collars about 3 km south of Burns, I observed the Lesser Sandhill Crane pair copulate. The incident occurred about 0925 on 9 April 1983. Weather conditions at the time were characterized by snow showers and low overcast, after a minimum temperature slightly below 0°C (NOAA-Burns, Oregon). About 500 lessers were feeding together in a mowed meadow when the male assumed precopulatory behavior. The female became receptive as the male approached, and coition occurred shortly thereafter. This was the first known record for copulation by this subspecies in southeast Oregon, and the first I am aware of for the species in the early phases of migration. No intensive behavioral studies of Lesser Sandhill Cranes have been conducted in this region; therefore, the regularity of copulation has not been ascertained. However, since the subspecies has a short time period for the nesting and brooding cycle, preterritorial copulation may be an adaption for successful reproduction at far northern latitudes.

Accepted 11 July 1985

FIELD ASSISTANTS NEEDED

Two volunteers are needed to help collect nesting and movement data on Prairie Falcons in western Wyoming. Food and field housing will be provided. Field work begins in early May and runs to mid-July. Volunteers are asked to stay at least 2 weeks (preferably 3 to 4). Some experience in handling birds or rock climbing is preferred. If interested, send a brief resume to: Bob Hitchcock, Wyoming Fish and Wildlife Coop. Unit, Box 3166, University Station, Laramie, Wyoming 82071. Phone: office (307) 766-2322, home (307) 721-2940.

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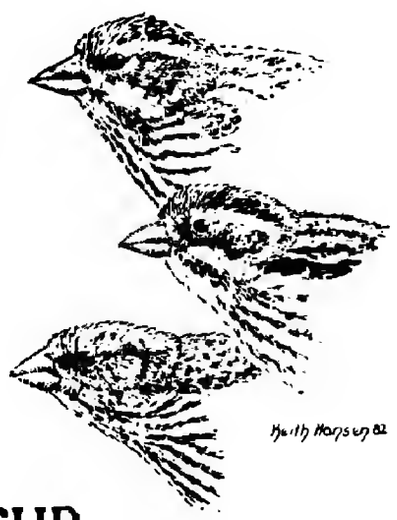

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Cover photo by William Ervin: Female Mountain Bluebird (*Sialia currucoides*), at nest hole, Grand Teton National Park, Wyoming, June 1983.

Manuscripts should be sent to Alan M. Craig, P.O. Box 254, Lakeview, CA 92353. For matters of style consult *Suggestions to Contributors to Western Birds* (6 pp. mimeo available at no cost from the Editor) and *Council of Biology Editors Style Manual* 4th edition, 1978 (available from the American Institute of Biological Sciences, 1401 Wilson Boulevard, Arlington, VA 22209 for $12.00).

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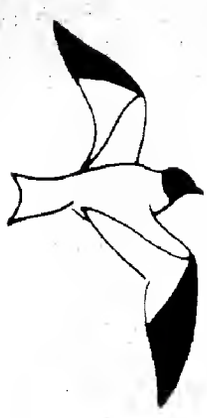

WESTERN BIRDS

Vol. 16, No. 4, 1985

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Published August 5, 1986

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WESTERN BIRDS

Volume 16, Number 4, 1985

OCCURRENCE AND IDENTIFICATION OF THE YELLOW-BELLIED FLYCATCHER ON SOUTHEAST FARALLON ISLAND, CALIFORNIA

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The occurrence in western North America, particularly in California, of numerous individuals of most migratory species of eastern North American passerines has been abundantly documented (McCaskie et al. 1979, Roberson 1980, Garrett and Dunn 1981). Because of its fortuitous location, size, topography and vegetation, and because of the continuous year-round presence of personnel from the Point Reyes Bird Observatory (PRBO), Southeast Farallon Island, 42 km west of San Francisco, California, has produced an inordinately large number of records of eastern passerines (DeSante and Ainley 1980, DeSante 1983). Eastern flycatchers of the genus *Empidonax*, however, with the exception of the Least Flycatcher (*E. minimus*), are represented there and elsewhere in western North America by very few documented records. Here we report two occurrences of the Yellow-bellied Flycatcher (*E. flaviventris*) on Southeast Farallon Island, the first of which constitutes the first record in California (Roberson 1980). In addition, we present some new information bearing on the identification of this species.

On 16 September 1976, at about 1530, a Yellow-bellied Flycatcher was captured by LeValley in a Heligoland trap surrounding a prostrate introduced Monterey Pine (*Pinus radiata*). The bird was immediately suspected of being *E. flaviventris* by virtue of its very bright plumage relative to that of three Western Flycatchers (*E. difficilis*), two of which were captured and banded, present that day. With the bird in hand, the following description was taken:

> Top of head, back, rump and upper tail coverts green, tinged with yellow. Eye ring pale yellow. Chin yellowish-gray. Center of throat bright yellow, sides of

throat grayish-green. Chest grayish-green, abdomen and vent bright yellow. Wings dark blackish-brown with yellow (not buffy-orange) wing bars. Underside of wing at bend of wrist sulfur-yellow (not buff). Tail dark blackish-brown. Bill blackish above, flesh-colored below. Mouth lining orange. Legs blackish. Sixth primary slightly cut out on outer web.

Measurements: wing (chord measured with standard wing rule), 62 mm; primary 10, 55 mm; primary 9, 62 mm; primary 8, 62 mm; primary 7, 62 mm; primary 6, 58.5 mm; primary 5, 54 mm; primary 4, 52 mm; primary 3, 51 mm. Tail (measured with calipers from the insertion of the central rectrices to the tip of the longest rectrix on the folded tail), 48.8 mm.

The individual was in juvenal plumage and had an incompletely pneumatized skull (class 1 on a scale of 0 to 3, with 3 being completely pneumatized). It showed no molt, had no fat, and weighed 9.9 gm. It was banded with USF&WS band 1420-39697, photographed and released. It was not seen again. The written report on this individual was given No. 13-1977 by the California Bird Records Committee (C.B.R.C.) of the Western Field Ornithologists.

On 27 September 1983, at approximately 1350, an *Empidonax* flycatcher was found by Ray Aker in a mist net located on the leeward side of the U.S. Coast Guard house near two fallen Monterey Cypresses (*Cupressus macrocarpa*). While removing the bird from the net, the rectrices were accidentally plucked. Eight rectrices were later recovered. Henderson recognized the bird as a possible Yellow-bellied Flycatcher and took the following description:

Head, back, rump and upper tail coverts *Empidonax* green. Crown slightly darker than back as a result of dark centers on crown feathers. Face rather uniformly colored, the green of auricular area not distinct from postauricular, malar or superciliary areas. Throat generally pale yellow, whitish on chin. A grayish-green wash across upper breast. Remainder of underparts yellow, brightest on lower throat and upper abdomen and palest on lower abdomen and flanks. Undertail coverts whitish washed with yellow. Eye ring pale yellow, thin and fairly uniform in width, only slightly pointed behind eye. Anterior wing bar pale yellow slightly washed with buff; posterior wing bar whitish with a yellowish wash, strongest at tips. Secondaries and tertials crisply margined on outer edges and tips with yellowish-white, the margins on tertials broad and boldly contrasted to the remainder of wing which was dark brownish-black. Underside of bend of wing at the wrist yellowish. Tail dark blackish-brown. Bill blackish above, pale fleshy-orange below with a smoky tinge toward sides and tip. Mouth lining orangish-yellow. Legs blackish. Sixth primary slightly cut out.

Although the records on the original data sheet state that the bird had a fully pneumatized skull (skull class 3), the plumage and shape of rectrix tips (Johnson 1963, 1974) indicate that it was a juvenal. The bird showed no molt, had a trace of fat, and weighed 8.9 gm. It was banded with USF&WS band 1480-03392, photographed by Keith Hansen, and released. It was seen once again later that day. On the following day, 28 September, the bird was netted on four different occasions. Late in the day the bird was found in the Heligoland trap in weakened condition; at approximately 1600 it was found dead. The individual was prepared as a study skin by Larry Spear and deposited in the collections of the California Academy of Sciences (CAS), San Francisco (71430). The bird proved to be a female.

ANALYSIS OF MEASUREMENTS

The tentative field identifications of C.B.R.C. record 13-1977 and CAS specimen 71430 as *E. flaviventris* are here corroborated by analyses of the shape of the wing tip (Figure 1) and by the ratio of the length of primary 5 plotted against tail length (Figure 2). The comparison in both analyses is between the Yellow-bellied and Western flycatchers, the two species of *Empidonax* most likely to be confused. In the absence in any collection of an adequate series of correctly-sexed fall juvenal Western Flycatchers, we use the wing and tail measurements of first-year specimens taken from Johnson (1974). This procedure is acceptable because first-year birds retain the juvenal rectrices and remiges through the post-juvenal (first prebasic) molt. Therefore, measurements for the juvenal-immature and first-year age categories are of feathers of the same generation that can be directly compared.

As Figure 1 demonstrates, *E. flaviventris* and *E. difficilis* have fundamentally different wing shapes. The wing tip of *E. flaviventris* is comprised of only three primaries, numbers 9, 8 and 7, and hence is more pointed, whereas that of *E. difficilis* is composed of four primaries, numbers 9, 8, 7 and 6, and thus is more rounded. Furthermore, each of the outer four primaries (numbers 10 through 7) of the Yellow-bellied Flycatcher averages slightly longer than in the Western Flycatcher, whereas each of the next three primaries (numbers 6 through 4) averages considerably shorter. The measurements of C.B.R.C. record 13-1977 (given above) and those of CAS 71430 (taken by Johnson; primary 10, 54.4 mm; 9, 61.2; 8, 62.4; 7, 61.7; 6, 59.0; 5, 54.4; 4, 51.7) clearly demonstrate that both birds represent *E. flaviventris*. Only for record 13-1977 is there a discrepancy. In this individual, the value for primary 9 is apparently faulty. It is approximately 1.5 mm longer than would be expected for an individual with this wing shape. This kind of error occurs easily when one attempts refined measurements on a living bird. No species of *Empidonax* has the sharply truncated wing tip that the field measurements of this individual suggest. All other values for this bird agree with those expected for *E. flaviventris*.

The length of primary 5, the wing feather character differing the most in average value in young females of the two species, can be combined with tail length in a scatterplot to differentiate between the Yellow-bellied and Western flycatchers (Figure 2). This ratio clearly shows that C.B.R.C. 13-1977 represents *E. flaviventris*. Analysis of CAS 71430 by this means is more difficult because the tail was plucked. However, from the longest rectrix saved (left number 6), we estimate a tail length of 51.3 mm for this bird. This value was obtained by measuring the total lengths of several individual rectrices detached from specimens in the Museum of Vertebrate Zoology and comparing these values with the standard tail lengths of the same specimens taken prior to feather plucking. This technique indicates that approximately 5 mm of each rectrix is embedded in the uropygium of the body and, therefore, is not included in the usual measurement of tail length, which is taken from the insertion of the central pair of rectrices. The ratio of the length of primary 5 to tail length again places CAS 71430 with *E. flaviventris*, well separated from the clump of values for the sample of *E. difficilis*.

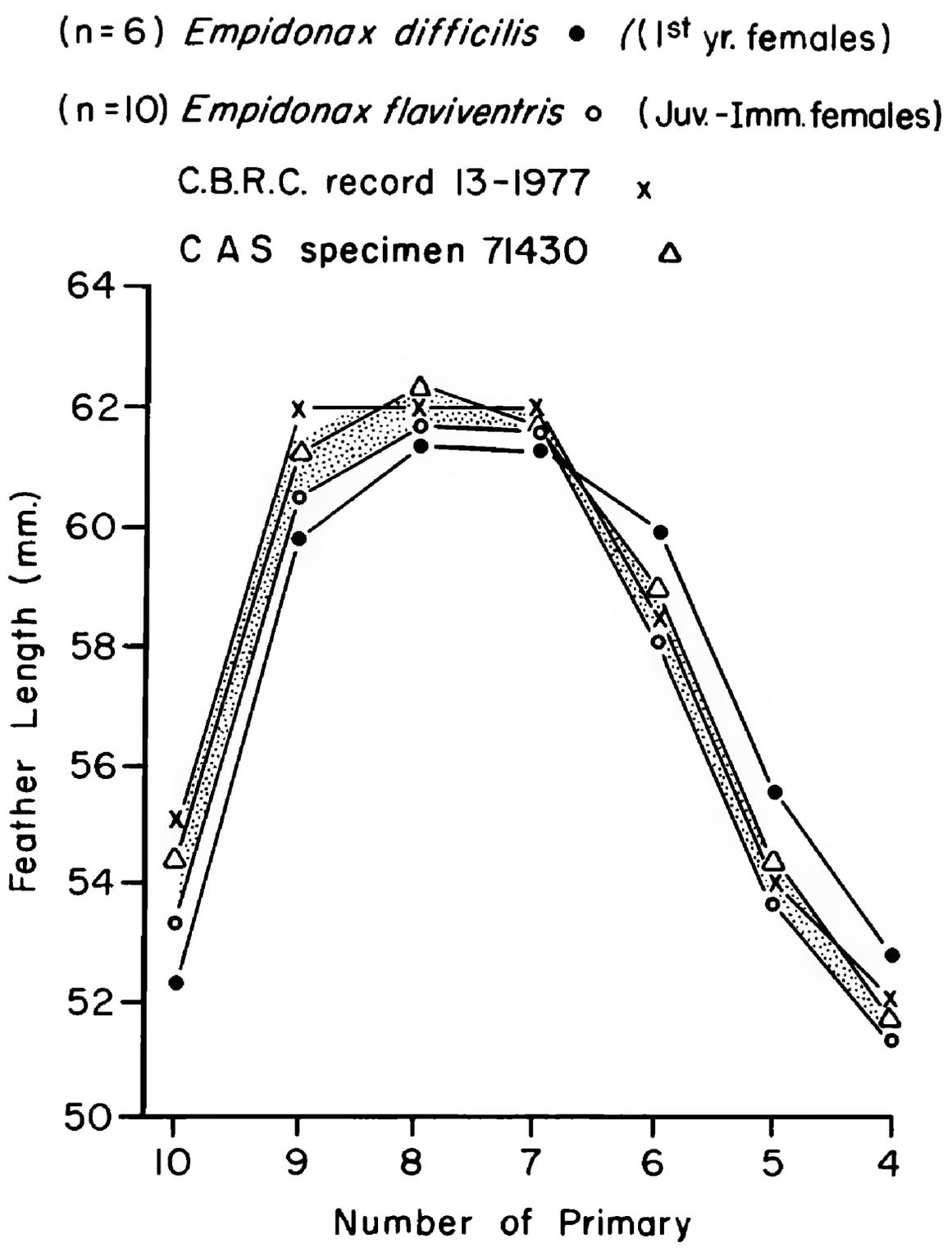

Figure 1. Quantitative appraisal of wing shape in young female *Empidonax difficilis* and *E. flaviventris*, based on the lengths of the outer seven primaries. Technique of measurement is described in Johnson (1963:90-91). Measurements are of fully grown primaries representing the juvenal generation of feathers. Values obtained in the field for C.B.R.C. record 13-1977, and in the museum for specimen CAS 71430, are compared with means of samples of the Western and Yellow-bellied flycatchers. The stippling serves to outline the general shape of the wing to be expected in young female *E. flaviventris*.

DISCUSSION

The Yellow-bellied Flycatcher breeds in boreal coniferous forest across much of Canada, west to northern British Columbia (east of the Rocky Mountains), and south to northern North Dakota and the Appalachians of northeastern Pennsylvania. It winters primarily in tropical lowland forests in eastern and southern Middle America and migrates regularly through the eastern United States, west to the central Great Plains and central Texas, and casually west to eastern New Mexico and western Texas (American Ornithologists' Union 1983). The only verified western extralimital records, other than those presented here, are of single individuals collected at Tucson, Arizona, on 22 September 1956 (Phillips et al. 1964) and at Coal

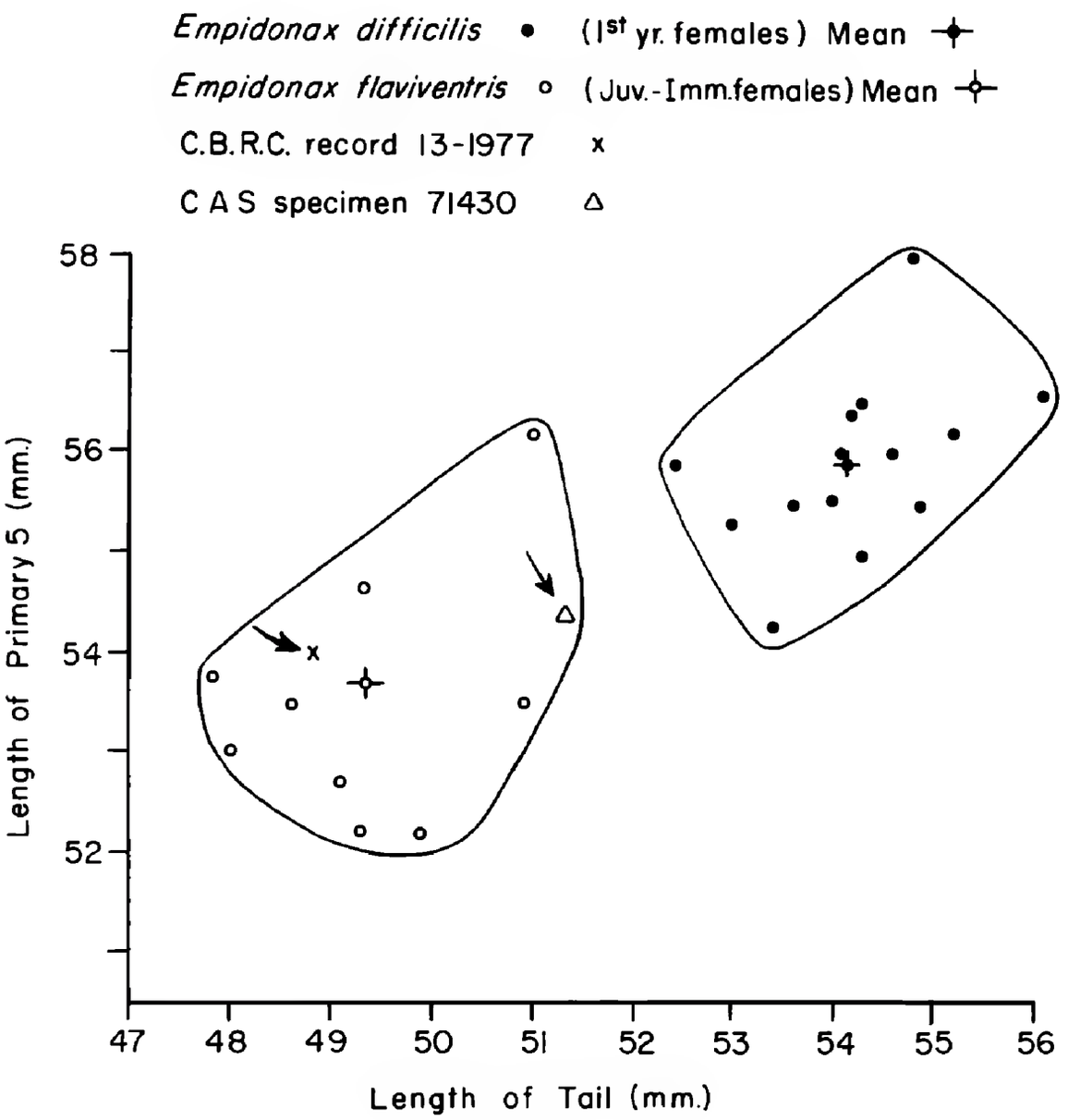

Figure 2. Scatterplot of values of length of primary 5 versus length of tail in samples of young female *Empidonax difficilis* and *E. flaviventris*. See text for method of determination of tail length of specimen CAS 71430.

Creek near the Yukon River in east-central Alaska on 28 July 1966 (White and Haugh 1969).

The Yellow-bellied Flycatcher probably occurs more regularly in western North America than these very few records suggest. Its breeding and wintering ranges and migration routes are very similar to those of a number of eastern species of wood warblers (*Parulinae*) that occur regularly as vagrants in fall and, to a lesser extent, in spring in coastal California. The breeding and wintering ranges of the Black-throated Green Warbler (*Dendroica virens*) perhaps most closely approximate those of the Yellow-bellied Flycatcher. This warbler, however, through 1979, was represented by approximately 110 fall and 18 spring occurrences in California (Roberson 1980), including 6 each in fall and spring on Southeast Farallon Island during the 8-year period 1968-1975 (DeSante and Ainley 1980). The Cape May (*Dendroica tigrina*), Bay-breasted (*D. castanea*), Mourning (*Oporornis philadelphia*) and Canada (*Wilsonia canadensis*) warblers also have breeding ranges similar to that of the Yellow-bellied Flycatcher, although they tend to winter somewhat farther south and/or east. During the eight-year period of 1968-1975, these four species of warblers were represented by, respectively, 8, 10, 5 and 10 fall records and 13, 13, 0 and 3 spring occurrences on Southeast Farallon Island (DeSante and Ainley 1980). Clearly, the Yellow-bellied Flycatcher has been recorded much less regularly than these species of warblers.

Part of the reason for the apparent scarcity of the Yellow-bellied Flycatcher (and, presumably, some other eastern species of *Empidonax* flycatchers) in western North America, must certainly be the extreme difficulty of distinguishing individuals from the regularly occurring species of *Empidonax*, especially the very common and very similar Western Flycatcher (*E. difficilis*). It is also likely, however, that *E. flaviventris* is in fact an extremely rare vagrant to California. Fully 224 of the 326 individual fall Western Flycatchers that were recorded on the Farallones during 1968-1975 were scrutinized in the hand and banded. None showed characters suggestive of *E. flaviventris*. Probably, the species has not been overlooked on the Farallones in recent years.

What then accounts for the scarcity of vagrant Yellow-bellied Flycatchers relative to species of wood warblers with similar ranges? Although the answer is unknown, it is worth mentioning that nine-primaried passerines (emberizids, including parulids) have been shown to be proportionally more common as vagrants on the Farallones than ten-primaried passerines (tyrannids, mimids, thrushes and vireonids) with similar breeding and wintering ranges (DeSante and Ainley 1980). Among non-parulids, perhaps the Philadelphia Vireo (*Vireo philadelphicus*) has breeding and wintering ranges and migration routes most similar to those of the Yellow-bellied Flycatcher. Through 1979, this vireo was represented by only 39 fall and 5 spring occurrences in California (Roberson 1980). During the eight-year period 1968-1975, it was recorded on the Farallones only once in fall and once in spring. The Philadelphia Vireo, therefore, seems to occur in California with only about 1/6-1/3 of the abundance of the Black-throated Green Warbler. Yet its abundance on the Farallones is not much different from that of the Yellow-bellied Flycatcher which has not yet been definitely recorded on the California mainland (a recent sight record from Point Reyes, Marin County, has yet

to be reviewed by the C.B.R.C.). We can conclude, therefore, that the Yellow-bellied Flycatcher has probably been overlooked on the California mainland.

The Least Flycatcher has occurred much more commonly than the Yellow-bellied Flycatcher, both on the Farallones [23 fall and 4 spring, 1968-1975 (DeSante and Ainley 1980)] and in California as a whole [53 fall and 11 spring through 1979 (Roberson 1980)]. The Least Flycatcher, however, breeds fairly commonly throughout British Columbia west of the Rockies and appears to be recently expanding its breeding range southwestward to include Washington, eastern Oregon and even northern California where it apparently bred in 1984 (Campbell and LeValley 1984). Its abundance, therefore, should be compared with that of such parulids as Blackpoll Warbler (*Dendroica striata:* 220 fall and 20 spring on the Farallones 1968-1975; 1333 fall and 72 spring in California through 1979), Tennessee Warbler (*Vermivora peregrina:* 57 fall and 43 spring Farallones; 684 fall and 211 spring California), and Magnolia Warbler (*Dendroica magnolia:* 34 fall and 37 spring Farallones; 218 fall and 107 spring California) that also breed west of the rockies in British Columbia (DeSante and Ainley 1980, Roberson 1980). Clearly, the Least Flycatcher is less abundant both on the Farallones and in California as a whole than these parulids.

Although the field identification of vagrant Yellow-bellied Flycatchers in western North America is extremely difficult at best and should not be generally encouraged, some observations prompted by the Farallon occurrences seem appropriate. Both Farallon individuals were immediately recognized as *E. flaviventris*, once in the hand, by their overall bright green upperparts and distinctly yellow eye rings, wing bars, and underside of the bend of the wing, as compared to the duller olive-green or brownish-olive upperparts, whiter, less yellow eye rings and distinctly buffy wing bars and bend of the underwing of fall juvenal *E. difficilis*. Another striking characteristic, displayed by both Farallon birds and by virtually all fall juvenal *E. flaviventris* in the Museum of Vertebrate Zoology and the California Academy of Sciences, is the extensive bright yellowish-white edgings to the secondaries and tertials that contrast boldly with the blackish remiges and wing coverts. These edgings are buffy or dirty whitish and more restricted in *E. difficilis* and contrast less with the paler and browner remiges and wing coverts of the Western Flycatcher. Roberson (1980), in discussing the identification of *Empidonax* flycatchers, stated that the eye ring of *E. flaviventris* is round rather than strongly teardrop-shaped or almond-shaped behind the eye as in *E. difficilis*. In both examples of *E. flaviventris* from the Farallones, the eye ring was slightly pointed behind the eye but not really teardrop-shaped. In addition, the eye rings of both Farallon Yellow-bellied Flycatchers were distinctly narrower than in typical *E. difficilis*, which probably have the widest and most teardrop-shaped eye rings of all North American species of *Empidonax*. These characteristics are subtle and subjective and have yet to be properly tested in the field. Nonetheless, a fall *Empidonax* in western North America that shows bright green upperparts, bright yellow underparts, a rather narrow yellow eye ring, only slightly, if at all, pointed behind the eye, distinctly yellowish wing bars, and extensive bright yellowish-white secondary and tertial edgings that contrast sharply with blackish remiges and wing

coverts would certainly deserve scrutiny and, if possible, capture and preservation for detailed study.

ACKNOWLEDGMENTS

We sincerely thank the members of the Point Reyes Bird Observatory for financial support and the Farallon Patrol of the San Francisco Bay Chapter of the Oceanic Society for logistic support. We also thank Laurence C. Binford for his helpful comments on the manuscript. Gene M. Christman drafted the final versions of the figures. This is PRBO Contribution 176.

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Accepted 24 October 1985

REPRODUCTION OF MOUNTAIN BLUEBIRDS IN SOUTHCENTRAL MONTANA

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Mountain Bluebirds (*Sialia currucoides*) occupy an extensive breeding range in western North America (Bent 1949). They breed in a greater variety of habitats, including the Upper Sonoran, Transition, Canadian and Hudsonian life zones, than other members of the genus (Power 1966, Herlugson 1978, Pinkowski 1979a). Although Ponderosa Pine (*Pinus ponderosa*) savannas are often used by breeding Mountain Bluebirds (Pinkowski 1979a), there are apparently no published reports of the reproductive biology of the species in Ponderosa Pine-dominated habitats. Here I report results of a 3-year study of Mountain Bluebird reproductive biology in a Ponderosa Pine savanna in southcentral Montana.

STUDY AREA AND METHODS

The study area is about 19 km north-northeast of Shepherd, Yellowstone County, in southcentral Montana, on unglaciated sedimentary plains with rolling topography formed primarily by erosion. Altitude is about 1200 m and annual precipitation averages 330 mm.

Ponderosa Pine savanna dominated the study area. Common shrubs were Big Sagebrush (*Artemisia tridentata*), Rocky Mountain Juniper (*Juniperus scopulorum*) and Skunkbush Sumac (*Rhus trilobata*). Common grasses included Bluebunch Wheatgrass (*Agropyron spicatum*), Blue Grama (*Bouteloua gracilis*), Prairie Junegrass (*Koeleria cristata*) and blue grass (*Poa* sp.). Broom Snakeweed (*Gutierrezia sarothrae*) and Small Soapweed (*Yucca glauca*) were common forbs. This habitat was similar to the *Pinus ponderosa/Artemisia tridentata* habitat described by Jorgensen (1979).

I studied the reproduction of Mountain Bluebirds during the summers of 1967, 1968 and 1969. Prior to the 1967 nesting season, 16 bluebird nest boxes were placed on the study area; these boxes were repaired as required. The nest boxes had inner dimensions of 12.7 x 12.7 x 20.3 cm, with an entrance hole diameter of 4.1 cm located 13.3 cm above the bottom of the box. Boxes were placed 1.3 to 1.6 m above the ground on living Ponderosa Pines (14) or fenceposts (2) along a triangularly shaped route about 2.25 km long. One natural nest, in a hollow stump, was included in this study.

The nests were checked every few days between late March and late July-early August. A nesting attempt was defined as a nest receiving at least one egg. Clutch size referred to completed clutches with incubation underway. The date of clutch completion was the day the last egg was laid in the clutch. If not observed directly, this date was calculated by assuming a 13-day incubation, with incubation beginning on the day the last egg was laid (Power 1966). Nest success was defined as the proportion of nesting attempts producing at least one fledged young. Bias in calculating nest success or nest density inherent in studies involving nest searches, as discussed by Miller and

Johnson (1978), was not a factor in this study, since only the nest boxes and one natural cavity were checked for nests.

Nesting attempts were divided into early and late nesting with a clutch completion date of 1 June separating the two groups. In 1967, however, when a late spring storm delayed the nesting, 12 June was used as the date of separation. "Late first broods" and "second broods," distinguished by Power (1966), were lumped in this study because Mountain Bluebirds may move on and off the area during the nesting season and may renest in another box, as observed by Pinkowski (1977) in the Eastern Bluebird (*Sialia sialis*).

Mean values were tested for statistical difference by using two-tailed t-tests and frequency data were compared statistically with chi-squared tests using 2x2 contingency tables corrected for continuity (Snedecor and Cochran 1967).

RESULTS

ARRIVAL DATES AND NEST BOX UTILIZATION

In 1967, four male Mountain Bluebirds were observed on 20 March. On my second visit, 25 March, eight males and three females were seen. I saw six males on 30 March 1969. These dates are probably near the date of first arrival on the study area because male Mountain Bluebirds usually arrive a few days in advance of the females (Criddle 1927). Each year of my investigation, 11 early nesting attempts were made on the study area (Table 1).

REPRODUCTION

The average date of clutch completion was influenced by the weather (Table 2). In 1967, one clutch was completed on 24 April, but a late spring storm caused other pairs to stop building and wait until late May to complete their clutches. In 1969, a snow storm and frost in early June destroyed many first clutches, resulting in earlier renesting. Under normal conditions, mean early clutches ($N=21$) were completed on the study area on 11 May (21 April-28 May) and late clutches ($N=8$) on 22 June (19 June-2 July).

Average clutch size for early clutches ($N=31$) was 5.23 ± 0.67 eggs per completed clutch. This clutch size differed significantly ($P<0.05$) from late clutches ($N=18$), which averaged 4.72 ± 0.67 eggs. Hatching success of completed clutches was similar ($P>0.3$) for eggs in early and late clutches (Table 1) and averaged 71% ($N=222$). Human disturbance (capturing the female for banding) and predation were the most important causes of failure of eggs to hatch for early and late clutches, respectively, but the causes of failure varied from year to year (Table 3). The most common predators of bluebird eggs on this area were Deer Mice (*Peromyscus maniculatus*) (Swenson 1968) and House Wrens (*Troglodytes aedon*), which destroyed eggs in five and two clutches, respectively, and caused the abandonment of these clutches.

Of a total of 267 eggs examined on and near the study area, none were albinistic, compared to 8.3% of 108 eggs in northcentral Montana (Power 1966) and 6.1% of 837 eggs in Manitoba (Munro et al. 1981). Albinism was

significantly less on my study area than on the other two areas ($P<0.005$). There was no statistical difference between the other two areas, however ($P>0.9$).

One nest was counted as two nestings, both failures. It contained 10 eggs, which were never incubated, on 18 June 1968. This nest was probably a "dump nest," with eggs contributed by two females, as has been previously observed in the Eastern Bluebird (Musselman 1935).

Table 1. Summary of Mountain Bluebird reproductive parameters in a Ponderosa Pine savanna in southcentral Montana.

Parameter	1967	1968	1969	Total
		EARLY NESTS		
Nesting attempts (A)	11	11	11	33
Successful nests (B)	7	7	4	18
Nest success (B/A)	64%	64%	36%	55%
Completed clutches (C)	10	11	10	31
Eggs laid (complete clutches) (D)	50	60(50)[a]	52	162(152)[a]
Clutch size (D/C)	5.00	5.45	5.20	5.23
Eggs hatched (E)	28	43	34	105
Hatching success (E/D)	56%	86%	65%	69%
Young fledged (F)	25	28(21)[b]	15	68(61)[b]
Nestling survival (F/E)	89%	49%	44%	58%
Fledglings per successful nest (F/B)	3.57	4.00	3.75	3.78
Fledglings per nesting attempt (F/A)	2.27	2.55	1.36	2.06
		LATE NESTS		
Nesting attempts (A)	3	8[c]	8	19[c]
Successful nests (B)	2	3	2	7
Nest success (B/A)	67%	38%	25%	37%
Completed clutches (C)	3	7	8	18
Eggs laid (complete clutches) (D)	13	33(18)[a]	39	85(70)[a]
Clutch size (D/C)	4.33	4.71	4.88	4.72
Eggs hatched (E)	8	14	31	53
Hatching success (E/D)	62%	78%	79%	76%
Young fledged (F)	8	13(9/9)[d]	10	31(27/48)[d]
Nestling survival (F/E)	100%	100%	32%	56%
Fledglings per successful nest (F/B)	4.00	4.33	5.00	4.43
Fledglings per nesting attempt (F/A)	2.67	1.62	1.25	1.63

[a]Number of eggs of known hatching success.
[b]Number of young fledged from nests with known hatching success.
[c]Excludes 3 nests of unknown outcome.
[d](Number of young fledged/Number of young hatched) for nests of known hatching success and outcome.

Table 2. Average dates of Mountain Bluebird clutch completion in southcentral Montana.

Year	First Clutches	Second Clutches
1967	24 May (11)[a]	22 June (2)
1968	10 May (11)	22 June (6)
1969	11 May (10)	10 June (6)

[a]Sample size

Table 3. Causes of Mountain Bluebird egg hatching failure in southcentral Montana.[a]

Year	Number of Eggs Laid	Number of Eggs Hatched	Dead Embryo or Infertile	Predation	Human Disturbance[b]	Desertion[c]
			EARLY CLUTCHES			
1967	52	54[d]	12	19	12	4
1968	50	86	4	0	10	0
1969	55	62	5	9	15	9
Total	157	67	7	10	12	4
			LATE CLUTCHES			
1967	13	62	0	38	0	0
1968	33	42	0	27	0	30
1969	39	79	10	10	0	0
Total	85	62	5	21	0	12

[a]All eggs, including those in incomplete clutches.
[b]Female was captured and banded.
[c]Female was not captured.
[d]Figures in this column, and in all columns to the right, are percentages.

Table 4. Causes of Mountain Bluebird nestling mortality in southcentral Montana.

Year	No. of Young Hatched	No. of Young Fledged	Mortality Factor: Weather	Predation	Accident	Unknown
			EARLY BROODS			
1967	28	89[a]	0	0	0	11
1968	43	49	0	9	0	42
1969	34	44	41	0	12	3
Total	105	58	13	4	4	21
			LATE BROODS			
1967	8	100	0	0	0	0
1968	9	100	0	0	0	0
1969	31	32	55	13	0	0
Total	48	56	35	8	0	0

[a]Figures in this column, and in all columns to the right, are percentages.

Table 5. Comparison of the frequency of clutch sizes and young fledged by clutch size in Mountain Bluebird nesting attempts in southeastern Montana (early clutches only).

Clutch Size	Frequency (%)[a]	Young fledged per successful nest
3	3	2.00
4	3	2.00
5	61	4.56
6	32	3.29

[a]N = 31.

Average brood size at fledging for first broods (N = 18) was 3.78 ± 1.56 young and for second broods (N = 7) was 4.43 ± 0.79 young. These brood sizes were not significantly different ($P>0.3$). Nestling survival was similar for both periods ($P>0.9$) and averaged 58% (N = 153). Adverse weather was the most commonly identified cause of nestling death for both brood periods, but it was a factor only in 1969 (Table 4), when a snow storm struck in early June and the area received heavy rains in late June. Deer Mice were the probable predators which destroyed two broods (Swenson 1968).

The number of young fledged per nesting attempt (Table 1) was higher for early nests (2.06) than late nests (1.63), but the difference was not significant ($P>0.2$). During this study, I observed a total of 33 early nesting attempts and 22 late attempts, including attempts of unknown outcome. Assuming that as many bluebird pairs entered the study area as left it to renest, and that each late attempt was a renest, each pair renested an average of 0.67 (22/33) times. The average pair produced 2.06 young from the first nesting and 1.09 young (0.67 attempts x 1.63 young/attempt) from the second nesting, or 3.15 young per year.

The most common early clutch size on the study area (5 eggs) was the most productive in terms of young fledged (Table 5). The reason that clutches of five were more productive than clutches of six was that survival of nestlings was significantly lower ($P<0.001$) in broods of six (67%, N = 30) than in smaller broods (94%, N = 72). Only nestlings in successful nests were considered in this comparison.

MOVEMENTS AND SITE FIDELITY

I banded 1 adult male, 19 adult females and 89 young during this study. Because the birds were not color-marked, movement data could only be obtained by recapturing banded birds. Recaptures of two adult females suggested that the female Mountain Bluebirds returned to the study area the following year, but not necessarily to the same nest site. One female was banded as an adult in nest 1 in 1967, recaptured in nest 8 in 1968 (330 m from nest 1) and in nest 3 in 1969 (335 m from nest 8). Another female, banded as an adult in nest 4 in 1967 was recaptured in nest 14 in 1968 (390 m from nest 4). These nest sites averaged about 350 m from the nest used the previous year. This distance is very similar to Pinel's (1980) finding that

six Mountain Bluebirds, banded as adults, were recaptured an average of 400 m from the site of banding in the aspen parklands of Alberta. In 1969, different females used nest 4 for the first and second nestings, even though the first attempt was successful.

Females became much more wary after banding; after being banded they left the nest box while I was still some distance from it. The difference in reactions to my approach between females which had been captured and those not previously captured that season was obvious. I captured 22 (71%) of 31 females completing early clutches but only 3 (17%) of 18 females completing late clutches, none of which had been captured previously that year. This difference is highly significant ($P<0.001$).

DISCUSSION

The observation of 11 early nesting attempts each year on my study area suggested that territorial behavior may limit the number of bluebirds using available nest sites and that all available territories were filled, as has been found in the Eastern Bluebird by Pinkowski (1979a). That this occurred the first year suggested there was a shortage of natural nest sites on the study area or that the boxes were preferred to the available natural nest sites. Subjective observations on my study area suggested that there was a relative shortage of adequate natural cavities. Several Mountain Bluebirds in the vicinity of the study area were found nesting in cavities that opened upward and one was quite exposed. This type of cavity is selected against by Eastern Bluebirds (Pinkowski 1976).

Both of the banded females recaptured in subsequent years had returned to the study area after nesting there unsuccessfully the previous year. This observation is in contrast to Pinkowski's (1977) finding that all 47 Eastern Bluebirds that returned to his study area had nested there successfully the previous year. Also, the significantly more wary behavior of females completing late clutches than that of females completing early clutches was most likely due to a large percentage of previously captured birds remaining on the area to renest. Although this conclusion is based on circumstantial evidence, I feel that it is strong enough to warrant the conclusion because of the marked change in female reactions to my approaches following banding. Pinkowski (1977) found that 66% of the female Eastern Bluebirds left his study area immediately after an unsuccessful nesting attempt, and that almost all successful birds stayed on the area.

Mountain Bluebirds on my study area apparently showed a stronger degree of nest site fidelity than that found in Pinkowski's (1977) study of Eastern Bluebirds. This difference is probably not due to behavioral differences between the species; Herlugson (1981) found that 68% of 22 successful female Mountain Bluebirds in Washington returned to the same territory and nest box the following year, compared to only two of five unsuccessful females. The apparent nest site fidelity in my area may have been due to a lack of suitable natural cavities. This theory was not tested, but was supported by general observations on the scarcity of adequate natural nest sites, the rapid occupation of territories (occupation of nest boxes was gradual on Pinkowski's study area), the apparently low rate of movement from the area

during the nesting season, the return of females to the area even after nesting there unsuccessfully the previous year, and the occurrence of dump-nesting.

If the nest site fidelity was as strong as the evidence suggested, the determination of annual productivity per pair was probably accurate. This parameter is difficult to measure in most passerines (Pinkowski 1979b). I estimated that 67% of the pairs renested and produced an average of 3.15 young per pair per year. Power (1966) found that 50% of all successful pairs (31% of all pairs) renested on his study area and Rounds and Munro (1983) suggested that renesting was common. Estimating annual productivity as I did can greatly underestimate the actual productivity if movement from the study area for renesting is great and is biased towards unsuccessful pairs (Pinkowski 1979b).

Cody (1966), modifying Lack (1947), postulated that, in nidicolous species in temperate regions, the average clutch size is probably determined ultimately by the average maximum number of young which the parents can successfully raise, based on the average food supply available in the area and season in question. This theory is not supported by the results of some studies (e.g. Middleton 1979), but it is supported by the results of my study, since the most young were fledged from the most common clutch size on my study area (5 eggs). It appeared as though the adults may have had difficulty in providing enough food to rear broods of six as successfully as smaller broods. Mountain Bluebirds are very insectivorous, thus sensitive to shortages of insects, and they increase the amount of hovering, an energetically costly foraging behavior, during times of higher nutritional needs, such as when feeding nestlings (Pinkowski 1979a, Power 1980, Herlugson 1982).

ACKNOWLEDGMENTS

I am grateful to my parents, Frank and Eva Swenson, for their support and encouragement during this study. I also thank Benedict C. Pinkowski, Harry W. Power, John P. Weigand, Robert L. Eng, D. Paul Hendricks and Cameron Barrows for reading drafts of this paper and providing many helpful comments. This paper is dedicated to the memory of my friend and mentor, Don C. MacDonald.

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Accepted 22 July 1985

NEARSHORE FLIGHTS OF SEABIRDS PAST YAQUINA ESTUARY, OREGON, DURING THE 1982 AND 1983 SUMMERS

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Although there have been several studies of seabird distributions off the Oregon and Washington coasts (e.g., Wahl 1975, Wiens and Scott 1975, Manuwal et al. 1979, Wahl et al. 1981, Matthews 1983, Wahl and Speich 1984), research has not been directed to determining the net movement of seabirds flying nearshore along these coasts. Interpretations of flights can be equivocal, but Marchant (1977) has shown that systematic observations of nearshore flights can provide valuable information about seabird distributions and movements.

I conducted this study to determine if selected seabirds, especially Common Murres (*Uria aalge*), exhibited significant net movements past the mouth of Yaquina Estuary. Dispersion or migration would be suggested by many more birds flying in one direction than another because if there were many watches, the numbers of birds flying to and from colonies or feeding areas should cancel each other out.

STUDY AREA AND METHODS

All observations were from a point about 0.2 km from land on the south jetty of Yaquina Estuary (44° 37'N, 124° 04'W), which is on the mid-Oregon coast in Lincoln County. During 5-min watches, I counted seabirds flying north or south through the field of view of a 20x telescope, which was pointed westward. The horizon of the sky was set near the top of the lower one-third of the field of view, and the telescope was 5-6 m above the water. Flying birds were observable to about 2-3 km offshore. I counted shearwaters (virtually all Sooty Shearwaters, *Puffinus griseus*, with occasional Pink-footed Shearwaters, *P. creatopus*), Fork-tailed Storm-Petrels (*Oceanodroma furcata*), Brown Pelicans (*Pelecanus occidentalis*), Brandt's (*Phalacrocorax penicillatus*) and Pelagic (*P. pelagicus*) cormorants, Common Murres and Pigeon Guillemots (*Cepphus columba*). During the June-September period, I conducted 124 watches in 1982 (mainly of shearwaters and murres) and 58 in 1983. Watches in 1982 were 10-25 min apart on 10 July and were a minimum of 56 min apart on other days; in 1983, there was one watch/day in June-August and 1-3 watches/day, 15-30 min apart, in September.

Watches in 1983 were divided into different intervals for each species based on changes in a bird's abundance. For example, watches for Common Murres were divided into four intervals (June-15 July, 16-31 July, 1-18 August, and September) because the abundance of murres differed greatly among these intervals (see below).

To determine if net movements were significant, the numbers of birds flying north versus the numbers flying south during watches were tested with a two-tailed Wilcoxon paired-sample test (Zar 1974: 124-126).

Table 1. Net number of shearwaters and Common Murres flying north past Yaquina Estuary, Oregon, during 5-min watches in 1982. The Wilcoxon paired-sample test was used to examine significance. P = probability; NS = not significant; a dash indicates no data available.

1982	Observation period (PDT)	Watches N	Net number of Sooty Shearwaters flying north per watch $\bar{x}$	SD	Range	P	Net number of Common Murres flying north per watch $\bar{x}$	SD	Range	P
10 Jul	1400-1830	27	-	-	-	-	90.2	88.0	(-38)-256	<0.01
22 Jul	1020-1920	7	-	-	-	-	137.4	252.4	5-706	<0.05
28 Jul	1150-2020	7	-	-	-	-	169.7	122.0	41-404	<0.05
30 Jul	0740-1945	10	-	-	-	-	56.9	55.4	2-173	<0.01
5 Aug	0650-1915	9	-	-	-	-	15.0	13.0	2-41	<0.01
12 Aug	0640-1900	9	-	-	-	-	2.6	3.2	0-10	<0.05
19 Aug	0650-1930	11	75.1	138.5	(-16)-407	NS	0.1	0.3	0-1	NS
26 Aug	0720-1900	10	32.4	35.0	(-7)-113	<0.02	0	0	0	NS
3 Sep	0740-1930	9	15.4	48.0	(-48)-100	NS	0	0	0-1	NS
16 Sep	0715-1900	10	20.2	33.0	(-1)-109	<0.05	0	0	0-1	NS

RESULTS AND DISCUSSION

In 1982, shearwaters were not common until August, and on the four census days in August and September their net movement was northward (i.e., the number of birds flying north was greater than the number flying south) each day and was significantly so on two of the days (Table 1). In 1983, shearwaters were first observed on 9 May, but there were fewer than 5/watch until 31 July. From then through September they commonly flew by, mainly northward (Table 2). The net number of shearwaters flying north in 1983 in the 30 July-September period was within the daily range of 1982 flights (Tables 1 and 2).

Fork-tailed Storm-Petrels were not detected in 1982, but a net average of 1.1 flying north was observed in 1983 between 15 August and 5 September (Table 2). They did not exhibit a significant northward trend (Table 2). Their unusual nearshore abundance in 1983 was also noted along the southern Oregon coast (Evanich and Fix 1983).

Brown Pelicans and cormorants both exhibited net averages of 0.1-0.5/watch flying north in 1983 (Table 2). The net number of pelicans flying north was barely significant, and the net number of cormorants flying north was insignificant (Table 2).

In 1982, the magnitude of Common Murre flights often changed within a day, but the only watches with net southward movements were on 10 July (Table 1). The net flight directions were significantly northward each day in July and on 5 and 12 August (Table 1). Net northward rates on 28 July

Table 2. Net number of birds flying north past Yaquina Estuary, Oregon, during 5-min watches from June to September 1983. The Wilcoxon paired-sample test was used to test significance. F. Storm-Petrel = Fork-tailed Storm-Petrel; Days = number of days of watches; P = probability; NS = not significant.

		Days	Watches	Net number of birds flying north per watch			
Taxon	1983 Period	N	N	$\bar{x}$	SD	Range	P
Sooty Shearwater	Jun-29 Jul	23	23	0.3	1.0	(-2)-2	NS
Sooty Shearwater	30 Jul-Sep	23	33	19.6	34.1	(-1)-134	<0.01
F. Storm-Petrel	Jun-14 Aug	30	30	0	0	0	NS
F. Storm-Petrel	15 Aug-5 Sep	7	8	1.1	2.5	(-4)-4	NS
F. Storm-Petrel	6-30 Sep	9	18	0	0	0	NS
Brown Pelican	Jun-Sep	46	56	0.5	1.9	(-3)-10	<0.10
Cormorant	Jun-Sep	46	56	0.1	4.6	(-16)-12	NS
Common Murre	Jun-15 Jul	15	15	0.7	44.9	(-75)-92	NS
Common Murre	16-31 Jul	9	9	28.2	29.5	(-1)-89	<0.01
Common Murre	1-18 Aug	10	10	5.7	12.5	(-6)-32	NS
Common Murre	Sep	12	22	0	0	0	NS
Pigeon Guillemot	Jun-Jul	24	24	0.1	0.9	(-1)-3	NS
Pigeon Guillemot	1-18 Aug	10	10	2.1	2.2	(-1)-7	<0.02
Pigeon Guillemot	Sep	12	22	0	0	0	NS

averaged almost 170/watch (Table 1), a rate of about 2000 murres flying north an hour. In 1983, murres most commonly flew by the jetties in June and July, but the only significant northward movements were in late July (Table 2). Even during the peak flight period of 1983, the net rates of flights were never as great as during the same period in 1982 (Tables 1 and 2). The differences between 1982 and 1983 may have been related to the 1983 El Niño as murres left the central Oregon coast much earlier in 1983 than 1982 (Bayer 1986) and both nesting success and adult survival of Common Murres along the Oregon coast was greatly reduced in 1983 (Graybill and Hodder 1985).

The significant northward movements of Common Murres in 1982 and 1983 occurred about the time that non-flying young of Oregon murres left nesting areas with their fathers to swim along the coast (Scott 1973). These flights could be of female and unsuccessfully nesting male murres migrating to the Strait of Juan de Fuca between Vancouver Island and Washington State, where many murres from Oregon and perhaps California arrive by September (Manuwal et al. 1979: 58-59).

Pigeon Guillemots infrequently flew past the jetties and showed a significant net movement (northward) only in the 1-18 August 1983 period (Table 2). There is no information on where Oregon Pigeon Guillemots migrate or disperse to after their nesting season, but perhaps they accompany the Common Murres to the Strait of Juan de Fuca.

CONCLUSIONS

All seabirds in this study showed net northward movements, but the movements were significant for only a few taxa during parts of the summer. Net movements in some areas can be the normal daily pattern (e.g., Sharrock 1973 cited in Marchant 1977), but Marchant (1977) observed that net movements may also be good indicators of bird migrations. In this study, it was not possible to prove conclusively that the significant net movements represented migration.

ACKNOWLEDGMENTS

I thank Dennis Paulson and Harry B. Nehls for constructive comments on an earlier draft of this paper. I am also grateful to Bill McNeil, Vern Jackson, Rob Lawrence, Mike Bauman and Andy Rivinus of Oregon Aqua-Foods for facilitating the logistics and funding of this project.

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Accepted 12 December 1985

Ivory Gull (*Pagophila eburnea*), St Lawrence Island, Alaska, June 1983

Photo by Bruce Maxwell

AMERICAN COOT AND BLACK-NECKED STILT ON THE ISLAND OF HAWAII

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Ornithologists studying the wetland avifauna of the island of Hawaii during the late 1800s reported two endemic species (Hawaiian Rail *Porzana sandwichensis* and Hawaiian Duck *Anas wyvilliana*), three endemic subspecies (American [Hawaiian] Coot *Fulica americana alai*, Black-necked [Hawaiian] Stilt *Himantopus mexicanus knudseni*, and Common [Hawaiian] Moorhen *Gallinula chloropus sandvicensis*), and one indigenous species (Black-crowned Night-Heron *Nycticorax nycticorax hoactli*) (Wilson and Evans 1890-1899, Rothschild 1893-1900, Henshaw 1902, Perkins 1903). The rail is now extinct. The moorhen, although present on other islands, has been extirpated from Hawaii. The coot, moorhen and duck are classified as endangered by the State of Hawaii and the Federal government (USFWS 1983). One other endangered endemic water bird, the stilt, was apparently absent from the island from 1896 to as recently as the early 1960s (Walker 1962, Banko 1979, Paton and Scott 1985). Research is currently being conducted on the Hawaiian Duck by the Hawaiian Division of Forestry and Wildlife (HDFW), as information on this species is limited (Jon Giffin pers. comm.). Surveys of the wetlands of Hawaii conducted over the past 20 years by the HDFW have provided baseline data on the population trends of the coot and stilt (unpubl. data on file, Dept. of Land and Natural Resources, HDFW). The purpose of this paper is to summarize existing knowledge of these two endemic water birds on the island of Hawaii.

STUDY AREA AND METHODS

The HDFW (then the Division of Fish and Game) initiated an annual census of migratory waterfowl in 1950. Native water birds were added to the count in 1958, but it was not until 1963 that all of the primary wetlands used by the coot and stilt on Hawaii were included. These wetlands (Aimakapa, Opaeula, Waiakea, and Lokoaka; Figure 1) have been described by Shallenberger (1977). Ponds on Hawaii are small, less than 11 ha (Armstrong 1973), with vegetation surrounding the ponds generally short, providing few places for coots and stilts to hide from observers. The HDFW census is conducted on one day in January, surveying all major wetlands on the island. Eight observers usually conduct the survey, with observers varying from year to year. A summer census, on one day in either late July or early

August, was initiated in 1968 to monitor population trends of native waterbirds during the critical summer months when water is generally scarce.

From 1975 through 1979, Scott regularly surveyed ponds in the Hilo area. Paton censused the major wetlands of the island opportunistically from January 1980 through December 1982. None of these surveys were conducted during standardized tidal or weather conditions; nonetheless we believe that the data give a realistic picture of true population figures.

Paton did the statistical analysis using MINITAB on the Colorado State University computer system. A priori alpha values of 0.05 were considered significant.

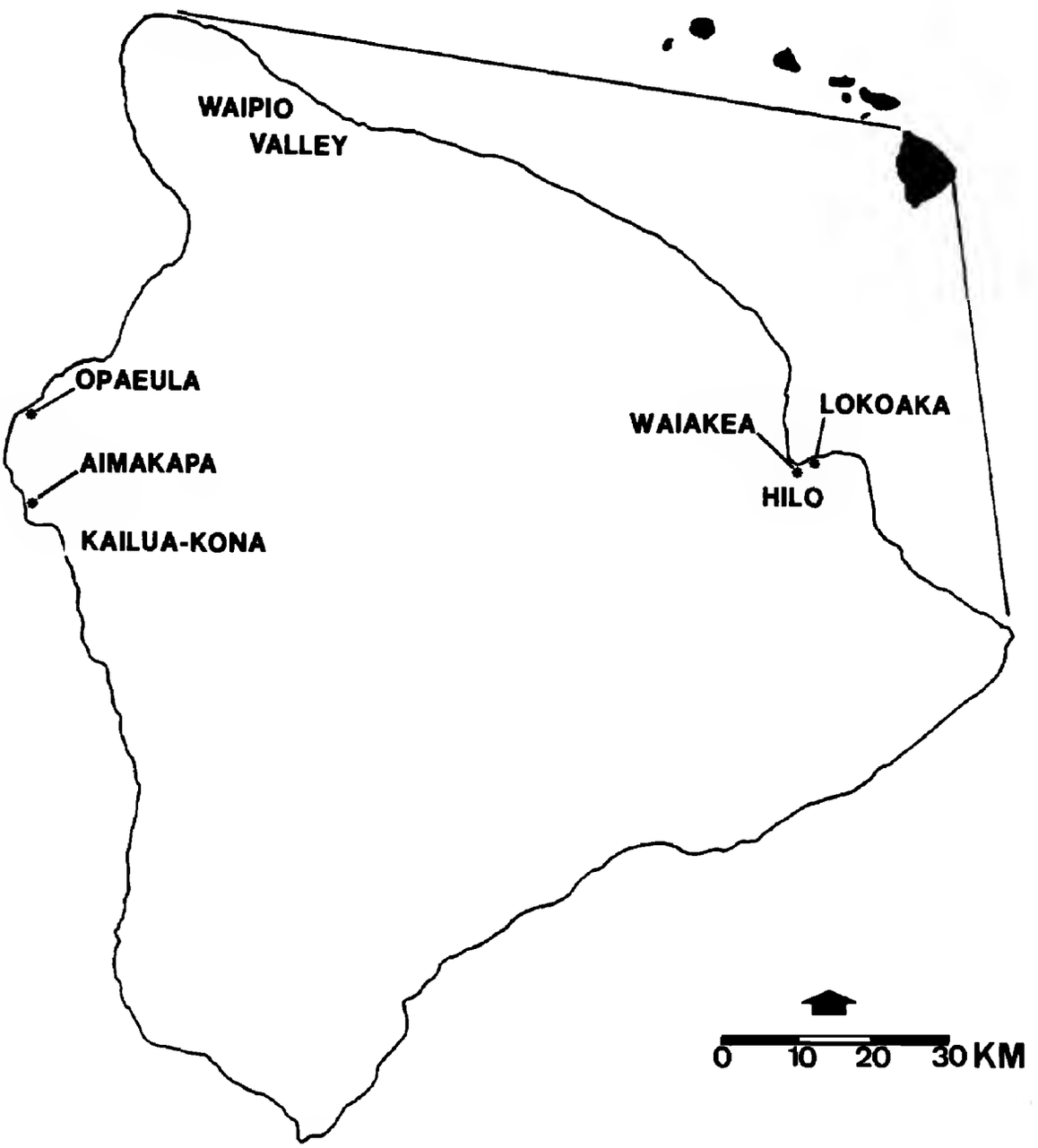

Figure 1. Map of the island of Hawaii showing the primary wetlands used by American Coot and Black-necked Stilt.

RESULTS

AMERICAN COOT. Information concerning coot population trends prior to 1958 can only be considered speculative. Data reported before the initiation of HDFW censuses were subjective and, therefore, no meaningful inferences could be made to present population levels. The coot was thought to be a common species in the wetlands at lower elevations on Hawaii in the late 1800s, though no population estimates were reported (Henshaw 1902, Perkins 1903). Schwartz and Schwartz (1952) listed the species as "rare" on Hawaii, occurring in a few ponds, reservoirs, and the taro fields of Waipio Valley. These authors did not mention if they visited Aimakapa or Opaeula.

Quantitative data collected since 1963 suggest that the coot population has risen recently. In comparing coot winter population figures from 1963 to 1971 with those of 1972 through 1981, one can see that the number of coots has significantly increased in the past decade (Mann-Whitney Test, $p = 0.006$; Figure 2). The median number of coots counted from 1963 to 1971 was 37.5 (range 20-46), whereas from 1972 through 1981 the median count was 62.5 (range 10-110). This increase occurred primarily on the west side of the island. The coot population at Aimakapa has increased from 11 birds in 1970 to 165 in September 1984 (HDFW, Pyle 1985).

The coot population on the east side of Hawaii has remained relatively small (median = 7.5 birds, range 3-15 during 1982). In 1968, 12 coots were observed at Waiakea Pond, whereas none were seen at Lokoaka Pond (HDFW, summer census data). By 1982, coot habitat use patterns on the east side had changed and the majority of the coots nested and foraged at Lokoaka. From November 1980 through October 1981, no coots were observed at Waiakea Pond during weekly surveys (PWCP pers. obs.).

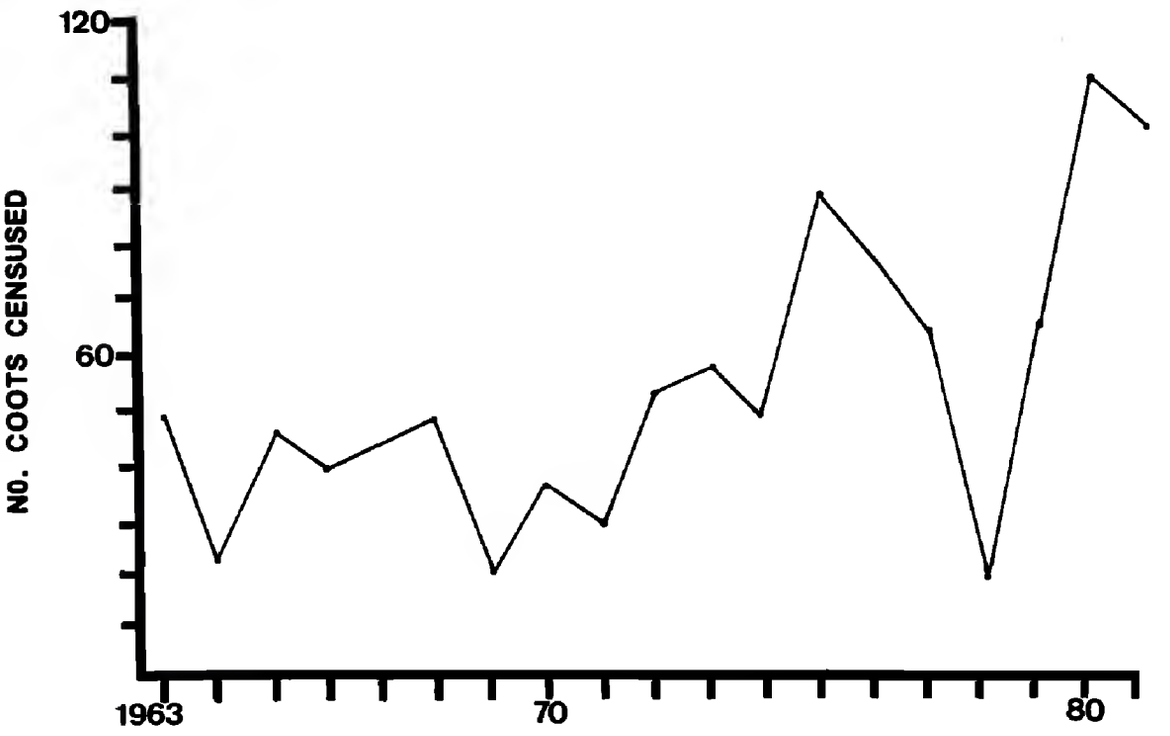

Figure 2. American Coot winter HDFW census results from 1963 to 1981.

The breeding biology of the coot was recently summarized, but included virtually no data for Hawaii Island because most work was done with this species on Oahu (Byrd et al. 1985). Coots nest at Aimakapa and Opaeula with young observed during all months of the year. However, peak nesting activities appear to occur in July with 10 incubating pairs observed at Aimakapa and 5 incubating pairs at Opaeula (PWCP). Coleman (1978) reported two nesting peaks on Oahu: November-February and June-October. Coot nests have been recorded at Lokoaka, but nesting has not been observed at Waiakea since 1978 (JMS pers. obs.). Four pairs of coots established nests at Lokoaka Pond in 1982, with a minimum of 8 young produced (PWCP pers. obs.).

BLACK-NECKED STILT. The status of this species on Hawaii Island remains uncertain. There are no fossils known of this species from Hawaii Island (Olson and James 1982). S.B. Wilson collected 1 adult female stilt in June 1896 labelled "Hawaii, H.I." (Carnegie Museum 55460), which is most likely from Hawaii Island (Banko 1979). We could find no other records of stilt between 1896 and 1961 on the island. No other ornithologist doing work in the late 1800s recorded stilts on Hawaii (Rothschild 1893-1900, Henshaw 1902, Perkins 1903). It is not known if any of these men visited Opaeula, but Perkins (1893) definitely visited Aimakapa to collect birds. Munro (1944) specifically stated that "there seems to be no record of it [stilt] from Hawaii."

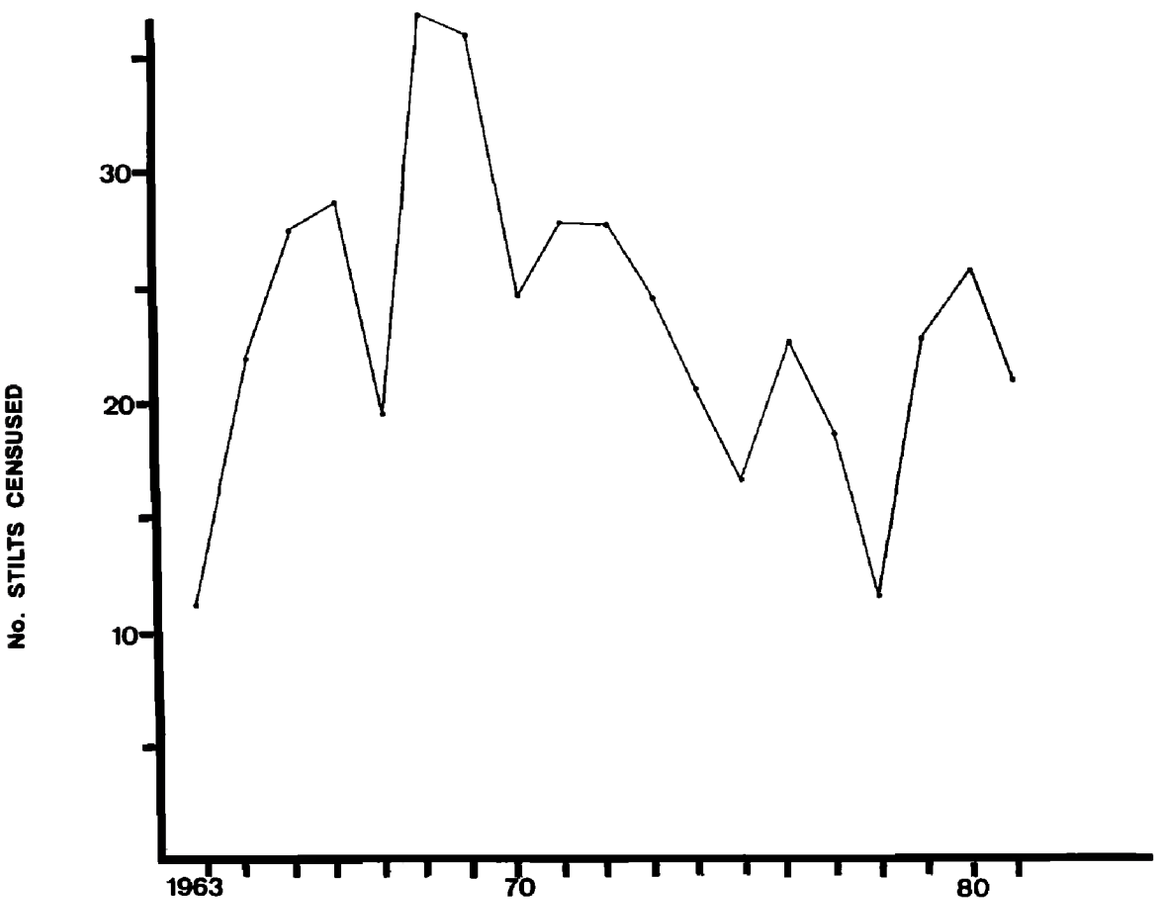

Figure 3. Black-necked Stilt winter HDFW census results from 1963 to 1981.

The first documented record we could find of stilts on Hawaii was of two birds seen at Aimakapa in August 1961 (Walker 1962).

Since 1963, the stilt population has remained relatively stable (Figure 3). A comparison of the island's stilt population from 1963 to 1971 versus 1972 to 1981 yielded no significant difference between the two periods (Mann-Whitney Test, $p = 0.103$). The median count for 1963 to 1971 was 27.5 (range 11-36), whereas from 1972 to 1981 the median count was 20 (range 11-26; HDFW). The highest stilt count on Hawaii was in January 1968, when 36 birds were recorded, but 35 stilts were counted as recently as 17 October 1982 (PWCP pers. obs.).

Stilts nested at Aimakapa and Opaeula during the 1960s and 1970s (Eugene Kridler and Robert Shallenberger pers. comm.). Five stilt chicks were observed at Aimakapa in May 1982 and one chick at Opaeula on 25 September 1982 (PWCP pers. obs.). On Oahu, the stilt breeding season usually extends from March through August but is concentrated in May and June (Coleman 1981). We did find a difference between summer and winter HDFW stilt censuses (Mann-Whitney Test, $p = 0.04$), although the biological implications of this observation are unclear. Surprisingly, the winter counts (median = 24, range = 16-36) were greater than the summer counts (median = 19, range = 15-27). Because stilts are thought to breed primarily prior to the summer census, we would have expected to see higher counts in July-August. The higher winter counts may be the result of post-breeding movements between islands; however, these results warrant further study.

There is only one reported record of a stilt on the east side of Hawaii. One bird was observed flying over Lokoaka on 11 April 1981. A sighting later the same week in the Mountain View area was probably the same bird.

Our data suggest intra-island movements of stilts, primarily between Opaeula and Aimakapa. Censuses on 19 July, 26 July and 16 August 1981 showed the same number of birds, but in different proportions, at Aimakapa and Opaeula (16:14, 18:12 and 22:8, respectively). Inter-island movements of stilts have been documented between Kauai and Oahu, and Maui and Oahu (E. Kridler and R. Coleman pers. comm.). Intra-island movements of banded birds have also been documented (E. Kridler and R. Coleman pers. comm.).

DISCUSSION

Increases in the coot population on Hawaii are probably due to changes in human use of the ponds on the west side of the island. Up to the early 1960s, Aimakapa was used by Hawaiians for the production of fish (E. Kridler pers. comm.). The continued disturbance caused by the maintenance of the pond's stone walls and the use of throw nets to capture fish probably limited the number of water birds using the pond. Since the early 1960s, the primary disturbance at Aimakapa is people using the beach on the west side of the pond. Water birds generally utilize only the east side of the pond now, except during crepuscular hours when human disturbance of the area is at a minimum (PWCP pers. obs.). Opaeula was used at one time by Hawaiians as a fish production pond, but now human disturbance of the area is sporadic.

Reasons for the avoidance of Waiakea Pond by coots are difficult to determine, though some observations suggest that the encroachment of grass into the shallower regions of the pond may inhibit coot utilization of the area. Throughout 1981 Para Grass (*Brachiaria mutica*) spread rapidly over the edges of Waiakea, extending up to 6 m in areas where the water was up to 1 m deep. Also, during this period the mouth of the Wailoa River, which flows into Waiakea, was completely covered by this exotic grass (PWCP pers. obs.). Para Grass was controlled up to 1979 with herbicides by the State Department of Parks and Recreation (George Kanemota pers. comm.). The Para Grass was dredged from the edges of the pond in June 1982 and up to 5 coots were observed foraging at Waiakea from August through October 1982 (PWCP pers. obs.), indicating that lack of foraging locations at Waiakea was limiting coot use of the pond.

The absence of stilts on the east side of the island may be due to the lack of suitable foraging sites. Both Lokoaka and Waiakea have steep banks and are too deep (>1 m) to allow stilts to walk on the bottom. Aimakapa and Opaeula on the other hand are generally shallow (<20 cm) and Opaeula in particular has several large shallow mudflats ideal for stilt foraging. Aimakapa and Opaeula have been designated by the Hawaiian Waterbird Recovery Plan as 2 of 17 essential water bird habitats in the Hawaiian Islands. Present plans propose federal acquisition of both ponds (Hawaiian Waterbird Recovery Team 1977). Aimakapa and Opaeula are presently under private ownership and future preservation of these two wetlands is uncertain. Loss of this habitat would mean the probable demise of stilts from the island and cause a significant reduction in coot numbers on Hawaii. In addition to being the primary nesting and foraging areas for over 95% of the island's stilts and 90% of the coots, over 100 migratory waterfowl regularly use these areas during the winter months (Paton and Scott 1985).

With the exception of data on population trends of these two species, their ecology has been little studied on Hawaii Island, in part because the Hawaii Island population represents only 3% of the total Hawaiian population for both the coot and stilt (Shallenberger 1977). Continued development of the lowlands of the Hawaiian Islands can only result in reduced numbers of Hawaii's endemic water birds. The importance of a specific wetland may not always be evident because the factors governing the utilization of an area by birds are often not fully understood. The only known breeding records of migratory waterfowl in the Hawaiian Islands occurred at Aimakapa, when Blue-winged Teal (*Anas discors*) nested at Aimakapa in 1982 and 1983 (Paton et al. 1984), yet Blue-winged Teal are an uncommon migrant to the island. One has to keep in mind that on Hawaii, where wetlands are limited, each wetland can have biological importance.

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Accepted 11 December 1985

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NOTES

RECENT ALTITUDINAL RANGE EXPANSION BY THE BROWN-HEADED COWBIRD IN COLORADO

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During a 2-year study of brood parasitism by the Brown-headed Cowbird (*Molothrus ater*) in 1977 and 1978 in Colorado, I noted substantial differences in the cowbirds' range from that described in the earlier literature.

Although the Brown-headed Cowbird is among the bird species described by the first naturalists in Colorado (Bailey and Niedrach 1965, Marsh 1968), virtually all observations of cowbirds at high altitudes are recent. Bailey and Niedrach (1965) described the Brown-headed Cowbird as a resident of the foothills, ranging up to 2134 m. Davis (1969) described cowbirds as common at lower elevations in western Colorado. Only Cooke (1897) mentioned cowbirds breeding up to 2440 m, but he considered them to be confined primarily to lower elevations. Warren (1980) was cited by Sclater (1912) as having observed cowbirds in Routt and Grand counties. However, Warren's expedition was for the purpose of mammal collecting and no locations of bird sightings were published. Sclater (1912) also considered the Brown-headed Cowbird to be a bird of the plains and foothills.

I have found Brown-headed Cowbirds to be as common in the mountain parks and river valleys as in the foothills and have frequently observed cowbirds up to 2895 m. I have seen individual cowbirds at Antero Reservoir, Park Co. (2725 m); 14 at Jefferson, Park Co. (2895 m); 15 at Malta, Lake Co. (2890 m); 25 at Gould, Jackson Co. (2712 m); flocks in excess of 25 up to 2500 m in the Laramie River valley, Larimer Co.; small flocks (3-8) up to 2650 m in upper Cherokee Park, Larimer Co.; and 20-40 at various times at Lake John Annex, Park Co. (2455 m). All sightings were from late May and June when the birds would be expected to be breeding.

The highest elevation I have found cowbird eggs has been 2475 m at South Delaney Buttes Reservoir in North Park, Park Co. Brewer's Blackbirds (*Euphagus cyanocephalus*) are commonly parasitized at Lake John Annex in North Park. Of 45 nests examined, 18 (40%) contained a total of 66 cowbird eggs. Three nests contained four cowbird eggs each and one nest contained six cowbird eggs in addition to three Brewer's Blackbird eggs. Keeler-Wolf et al. (1972) reported finding a cowbird egg in a Yellow Warbler (*Dendroica petechia*) nest near Crested Butte, Gunnison Co. (2895 m), and considered the Brown-headed Cowbird to be common in the area.

Thus, the Brown-headed Cowbird is presently a common breeding bird at substantially higher elevations than generally reported by earlier naturalists. Unless it was generally overlooked, the Brown-headed Cowbird has recently expanded its numbers and range in the mountain parks and river valleys of Colorado.

The Brewer's Blackbird is clearly a major host to the Brown-headed Cowbird at high elevations. However, unlike the cowbird, the Brewer's Blackbird has been an abundant breeding bird up to 3050 m from at least the late 19th century on (Cooke 1897, Sclater 1912). Therefore, it is unlikely that the spread of the Brown-headed Cowbird is correlated with the spread of this host species.

Range expansion eastward by the Brown-headed Cowbird has been largely attributed to clearing of the forests and increased agriculture (Friedmann 1963, Mayfield 1965). The mountain parks and upper river valleys in Colorado are heavily grazed by

cattle, and the altitudinal range expansion of the Brown-headed Cowbird in Colorado may be attributable to habitat alteration. A similar expansion of range in the Sierra Nevada of California was discussed by Rothstein et al. (1980) and Verner et al. (1983).

I thank Paul Baldwin, C. Richard Tracy and Ronald Ryder for reading the manuscript and offering criticisms.

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Accepted 16 April 1985

UNUSUAL NEST SITE FOR GREATER SANDHILL CRANES IN COLORADO

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In Colorado, the Greater Sandhill Crane (*Grus canadensis tabida*) historically nested in high mountain parks (to 2896 m) over much of the western portion of the state (Sclater 1912, Bailey and Niedrach 1965). Currently it nests only in Jackson and Routt counties (Walkinshaw 1973, Bieniasz 1978, Ellis and Haskins 1982) in areas of open parkland with willow (*Salix* spp.) lined drainages and sagebrush (*Artemisia* spp.) covered ridges. These parklands are surrounded by Quaking Aspen (*Populus tremuloides*) with mixed Lodgepole Pine (*Pinus contorta*) and Subalpine Fir (*Abies lasiocarpa*). All previous confirmed Greater Sandhill Crane nests (n = 104) in Colorado have been in water or very closely associated with water (Ellis and Haskins 1982). This note describes a nest located during 1982 in habitat not previously reported for Greater Sandhill Cranes in Colorado.

On 18 June 1982 we received a report of a crane nest containing one egg near a dry-land wheat field 15 km northwest of Steamboat Springs (Routt County). A search on 24 June resulted in the discovery of a pair of adult Greater Sandhill Cranes. As we approached, the pair sounded alarm calls (Voss 1976), flushed, and circled overhead for approximately 1 minute before landing on a hillside 0.3 km away where they continued to call. A search in the area from which they flushed revealed a typically constructed ground nest of small diameter twigs. On top of the nest was an inner shell membrane and egg shell fragments. The parental behavior of the adults and the evidence found on the nest indicated that the egg had hatched successfully. Our search for the chick was unsuccessful. After we left the immediate area of the nest one of the adults returned; the other remained on the hillside, calling, until we departed.

The nest was placed on a hillside dominated by sagebrush, Gambel's Oak (*Quercus gambelii*), mule's ear (*Wyethia amplexicaulis*), and mixed grasses. A dry-land, fallow wheat field was located approximately 75 m east and a moderately used county road was 200 m east. No open water was visible from the nest although the presence of a small group of sedges (*Carex*; approximately 250 m^2) just east of the county road suggests it may have been a seepage area earlier in the year. The nearest available water at the time of nest discovery consisted of a stock pond approximately 0.8 km away.

On 25 July we returned to band the chick. The area was very dry and most of the ground vegetation was dead. No cranes were seen during a thorough search. It is not known whether the chick perished or was taken to more suitable habitat by the adults.

The affinity of Greater Sandhill Cranes for water when choosing a nest site has been well documented (Walkinshaw 1973, Littlefield and Ryder 1968, Drewien 1974). In Oregon, Littlefield and Ryder (1968) found that only 2 of 122 nests were not in or very near water; both were approximately 200 m distant. Greater Sandhill Cranes in Idaho, however, show a stronger tendency to nest on dry land (Drewien 1974). Mean distance from water for the 150 dry-land nests observed by Drewien was 4.6 m (mode = 0.3 m). The aforementioned seepage may have provided the water element that seems to be essential to Greater Sandhill Crane nesting territories at the time of nest initiation.

Our observations were made while under the employ of the Colorado Division of Wildlife, federal aid project SE-5-1. We thank project coordinator Tom Lytle for logistic support. Ronald Ryder, C.D. Littlefield, Scott Derrickson, Joseph R. Murphy, Clayton M. White and Robert J. Meese reviewed earlier drafts of the manuscript.

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Accepted 27 October 1984

PARTIAL ALBINISM IN A MELANISTIC MEW GULL

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On 18 February 1979, at Moss Landing, Monterey Co., California, I observed for 5 minutes and photographed (Figure 1) a predominately melanistic gull that had pure white feathering scattered over the body and wings. I identified the bird as a sub-adult Mew Gull (*Larus canus*) on the basis of size, head and bill shape, and voice. Compared to nearby California Gulls (*L. californicus*), it was distinctly smaller and had a more rounded forehead and smaller bill. The high pitched call characteristic of this species was heard two or three times. The leg color was pink, which is typical of Mew Gulls in their first year. I did not note the bill color.

The predominate color of the body and wings was a deep chocolate brown close to the "blackish brown" of Villalobos (1962) and only slightly darker than the color of a first-year Heermann's Gull (*L. heermanni*). This color appeared to be evenly distributed over the wings and body, with no evidence of counter-shading. The white feathering was confined to the crown, nape, sides of the head, scapulars, right flank, the outer five or six primaries of the left wing, and the upper primary coverts of the right wing.

Gross (1965b) reported only two cases of melanism in North American gulls, one each in the Herring Gull (*L. argentatus*) and the Laughing Gull (*L. atricilla*). Of 1847 cases of partial or complete albinism in North America, Gross (1965a) reported 33

Figure 1. A melanistic Mew Gull (*Larus canus*) with partial albino feathering at Moss Landing, Monterey Co., California on 18 February 1979.

Photos by Jon Winter

(1.8%) in the Laridae, involving 10 species. He did not list the cases by species. Sage (1962) reported albinism in *L. c. canus* and seven other gulls found in the British Isles and melanism in the Lesser Black-backed Gull (*L. fuscus*), Herring Gull and Common Black-headed Gull (*L. ridibundus*).

The occurrence of albinism and melanism in a single individual appears to be an exceptionally rare phenomenon. I was able to find only one case in a gull. Harrison and Harrison (1962) reported a Black-headed Gull from the British Isles that had entirely white primaries but otherwise normally pigmented feathers; the melanism was confined to patches on the tarsi, toes, webs and nails. Sage (1962) noted the combination of albinism and melanism in a Eurasian Curlew (*Numenius arquata*) and a Blue Tit (*Parus caeruleus*) in the British Isles.

Harrison (1963) warned that many cases of so-called melanism have turned out to be "industrial" discoloration. If the Moss Landing bird had been stained, I would have expected the dark plumage to be less uniform and the unpigmented feathers to show some evidence of discoloration. This was not the case.

Any explanation for the unusual plumage in this gull is tenuous at best. Sage (1962) indicated that abnormal melanism and partial albinism can result from a number of different (including nongenetic) phenomena. Partial albinism has been linked to changes in diet (Rollin 1953, 1959), injury (Hutt 1949), disease (Brimley 1944) and possibly shock and age (Sage 1962). Abnormal melanism has been attributed to the dietary deficiency of vitamin D in poultry (Decker and McGinnis 1947). The Mew Gull at Moss Landing appeared to be healthy, and no unusual behavior was noted.

This note is Contribution 218 of Point Reyes Bird Observatory.

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Accepted 15 November 1985

IDENTIFICATION NOTES

The Identification Paper Committee continues to encourage the submission of brief notes on yet-to-be-resolved identification problems. The following note on the calls of two very similar *Empidonax* flycatchers is an example of such a note. It is not intended to be the final word, but will encourage, we hope, further investigation.

CALLS OF ALDER AND WILLOW FLYCATCHERS

Until fairly recently, most observers did not attempt to separate Alder (*Empidonax alnorum*) and Willow (*E. traillii*) flycatchers in the field except by song and, indirectly, by breeding range and habitat (not safe in many areas). The idea that these two species, and most Empids in general, are readily identifiable only on the basis of song and breeding habitat has been instilled by many of the early breed of field guides. The result has been that many observers do not attempt identification of migrating *Empidonax* flycatchers. But many individuals in this group *call* during migration, as well as on the breeding and wintering grounds, and these calls are very useful in identifying many of them to species. Many silent Empids, if followed long enough, will give a call note (or rarely, in a few species such as Willow, a song) at some point!

The typical call notes of Alder and Willow flycatchers are distinctly different, and probably provide, in addition to song, the best means of identifying the two in the field. Willow's typical call is a liquid "whit," softer in tone than the more emphatic, sharp "whit" of the typical Least Flycatcher (*E. minimus*). Willow Flycatchers are frequently heard calling in migration. The typical call of the Alder Flycatcher is a sharp note, variously transcribed "pip," "peek," or "bic." The quality of this call is quite different from that of a Willow, and has been likened to the call of Hammond's Flycatcher (*E. hammondii*), Pygmy Nuthatch (*Sitta pygmaea*), or, vaguely, Long-billed Dowitcher (*Limnodromus scolopaceus*). Certain other, less commonly heard calls of Alder and Willow flycatchers may also be useful for identification; here is a fruitful area for further study.

Although most observers will be understandably reluctant to report extralimital sightings of either species solely on the basis of calls, awareness of these differences can allow observers to focus their attention on the odd-sounding individuals. Increased attention to identification of these two species on migration would certainly go a long way towards a better understanding of their relative status in different parts of the continent.

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PLUMAGE WEAR IN *VIREO BELLII*

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In this note I respond to and expand on some of the ideas presented by Stallcup (1984) in his "identification quiz" on Bell's Vireo. The bird depicted in the quiz was photographed at San Blas, Nayarit, in December 1975. The published black-and-white print is a reproduction of an original color slide, which Bruce Webb and Tim Manolis kindly loaned me. The written description in the quiz, however, is of a bird captured in San Diego County, California, as Stallcup (pers. comm.) has pointed out. Stallcup's description, "in life, this bird was white below and gray above with scarcely a

trace of green or yellow," implied that a bird answering the description of *V.b. pusillus* had been photographed at San Blas, since the discussion did not mention the provenance of the bird on which the written description was based. This erroneous impression merits correcting because the published winter range of *pusillus* is confined to southern Baja California (Friedmann et al. 1957, AOU 1957). The bird photographed in San Blas, to judge from the original color slide, was most likely *not pusillus*, since it shows some contrast between a plain gray head and a slightly olive-tinged back. Any further speculation on its subspecific identity is unwarranted; identification of Bell's Vireo races cannot be made conclusively on the basis of photographs, since light and film conditions are unknown variables. As with most subspecies, such identifications must be made through comparison with preserved specimens.

Vireo bellii consists of four subspecies: *pusillus*, breeding in California and northwestern Baja California (see Goldwasser et al. 1980 and Wilbur 1980 for details of current range), *arizonae*, breeding from the Colorado River east through Arizona and south through Sonora, *medius*, breeding from western Texas south to northern Durango and eastern Coahuila, and nominate *bellii*, breeding from eastern Colorado, eastern Texas, and Tamaulipas east to the Mississippi River region (Ridgway 1904, AOU 1957). As Stallcup mentions, the eastern races are brighter green and yellow than the western. More specifically, the four races represent a gradation: each subspecies is more brightly colored than its neighbor to the west. Plumage wear and fading, however, markedly change the birds' appearance; they convert yellow-green birds into grayer ones. To identify properly specimens of Bell's Vireo, one must compare birds collected at the same season. Faded summer specimens of *arizonae* become as gray as fresh fall *pusillus*. (Bell's Vireo has the molt schedule common among North American passerines: a single complete annual molt, which takes place after nesting but within the breeding range.) A *medius* collected on 8 May looks much like an *arizonae* collected on 25 January; both specimens are in the San Diego Natural History Museum and were identified by Allan R. Phillips. This January *arizonae* has a conspicuously greenish back and yellowish flanks that distinguish it easily from even the freshest (late August) specimens of *pusillus*. The difference in fresh plumage between *pusillus* and this specimen of *arizonae* is enough to surprise a Californian like myself who is familiar only with pale gray, faded, summer *pusillus*. I suspect that many of the fall sight records of "eastern" Bell's Vireos in California are based on fresh *arizonae*.

I thank Rich Stallcup and Tim Manolis for their review of an earlier version of this note and for correcting the confusion in the identification quiz. I thank Allan R. Phillips for identifying the January specimen of *arizonae* that turned my attention to the problem of plumage wear in *Vireo bellii*.

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Accepted 23 August 1985

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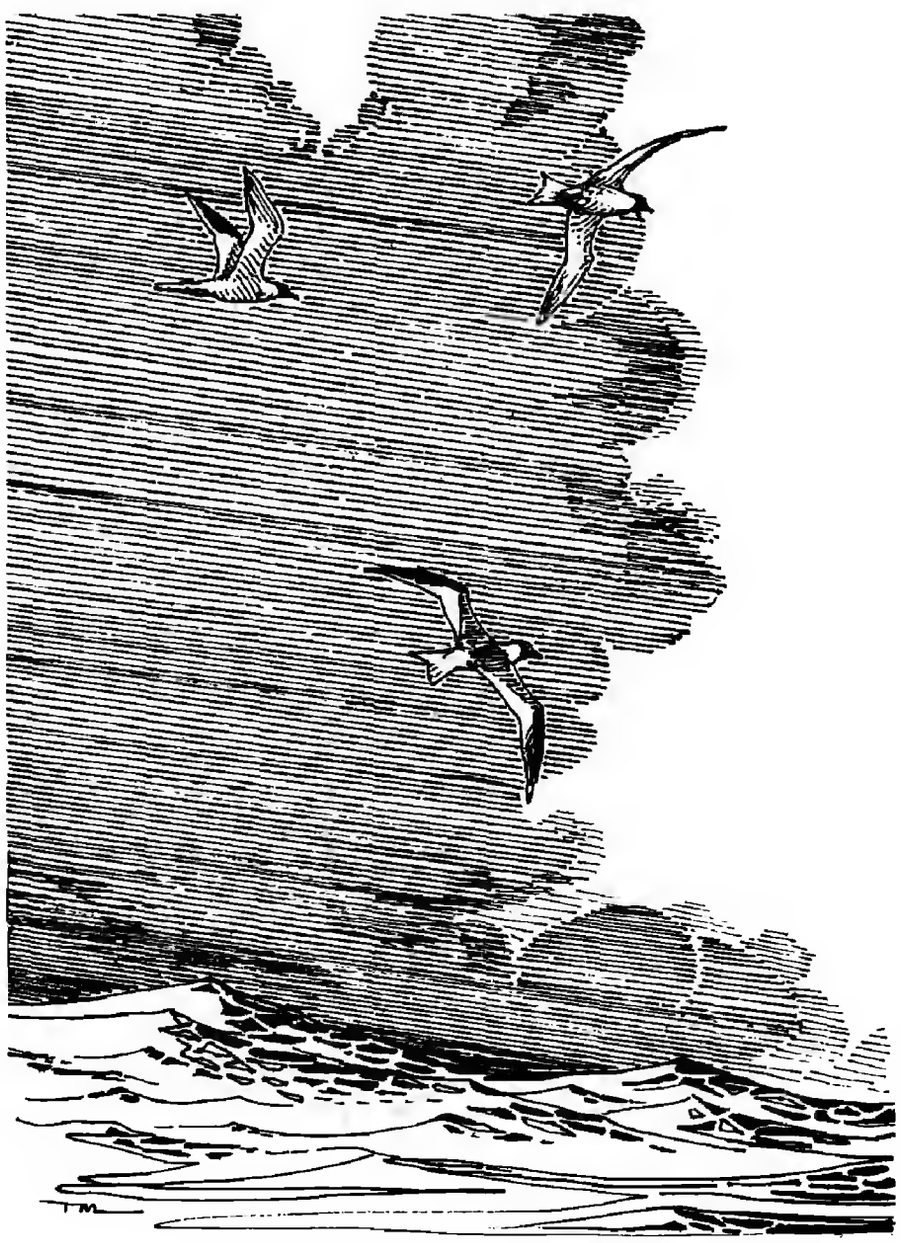

Sabine's Gulls *Sketch by Tim Manolis*

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Cover photo by Bruce Maxwell: Crested Auklet (*Aethia cristatella*), Pribilof Islands, Alaska, June 1983.

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